

UNIVERSITY OF CALIFORNIA
LICK OBSERVATORY TECHNICAL REPORT

No. 73

THE HAMILTON SPECTROGRAPH TH-AR ATLAS

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Santa Cruz, California

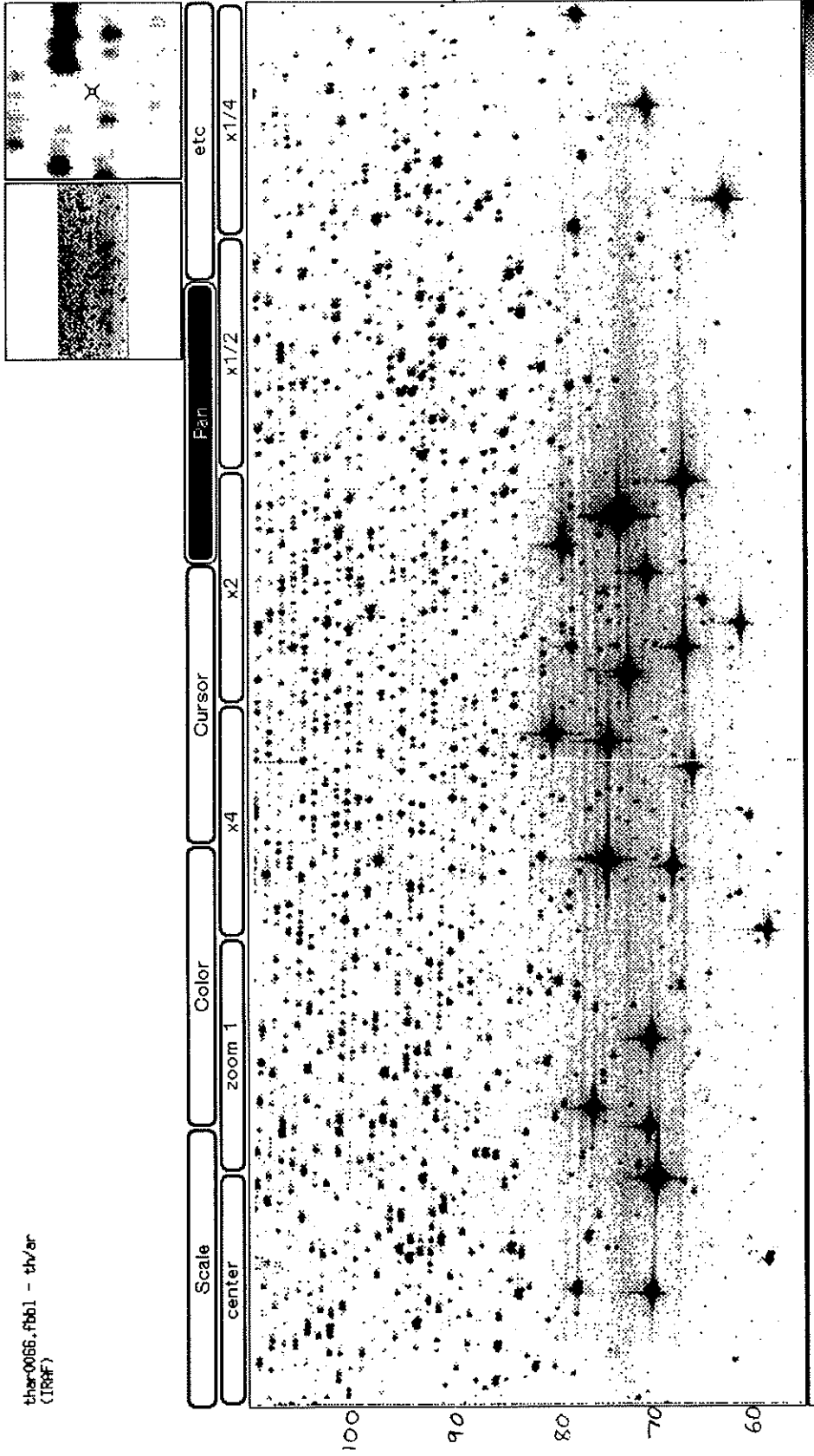
May, 1994

The Th-Ar Atlas

This thorium-argon spectra was taken on October 6, 1993, with the 2048x2048 Ford chip installed in Dewar 13 for the Hamilton Spectrograph. The thorium-argon lamp was a Fisher Scientific WL-32809 hollow cathode. The decker was set to 2.5 arcseconds and focused at 6300 angstroms. The Hamilton controller gave the current for the lamp as 3mA. The exposure length was 5 seconds using the BG-14 filter (to block some of the red flux). This should not be considered the standard combination of filters and exposure times because the optimal setting often depends upon which portion of the spectrum one is interested. The spectra was reduced with NOAO IRAF routines for echelle reductions. The lamp did have the bias subtracted and was flat-fielded, but no attempt has been made to replace bad columns, subtract scattered light, or remove bleeds. The lines were identified and plotted from within the eidentify program. The lines marked were chosen because of a combination of strength and proximity to other lines. The very strong argon lines in the red tend to bleed-over into other orders. The amount of bleeding may change depending on the integration time and the choice of filters. I have marked some of the strong bleeds by hand. These bleeds should be ignored when looking for patterns among the lines.

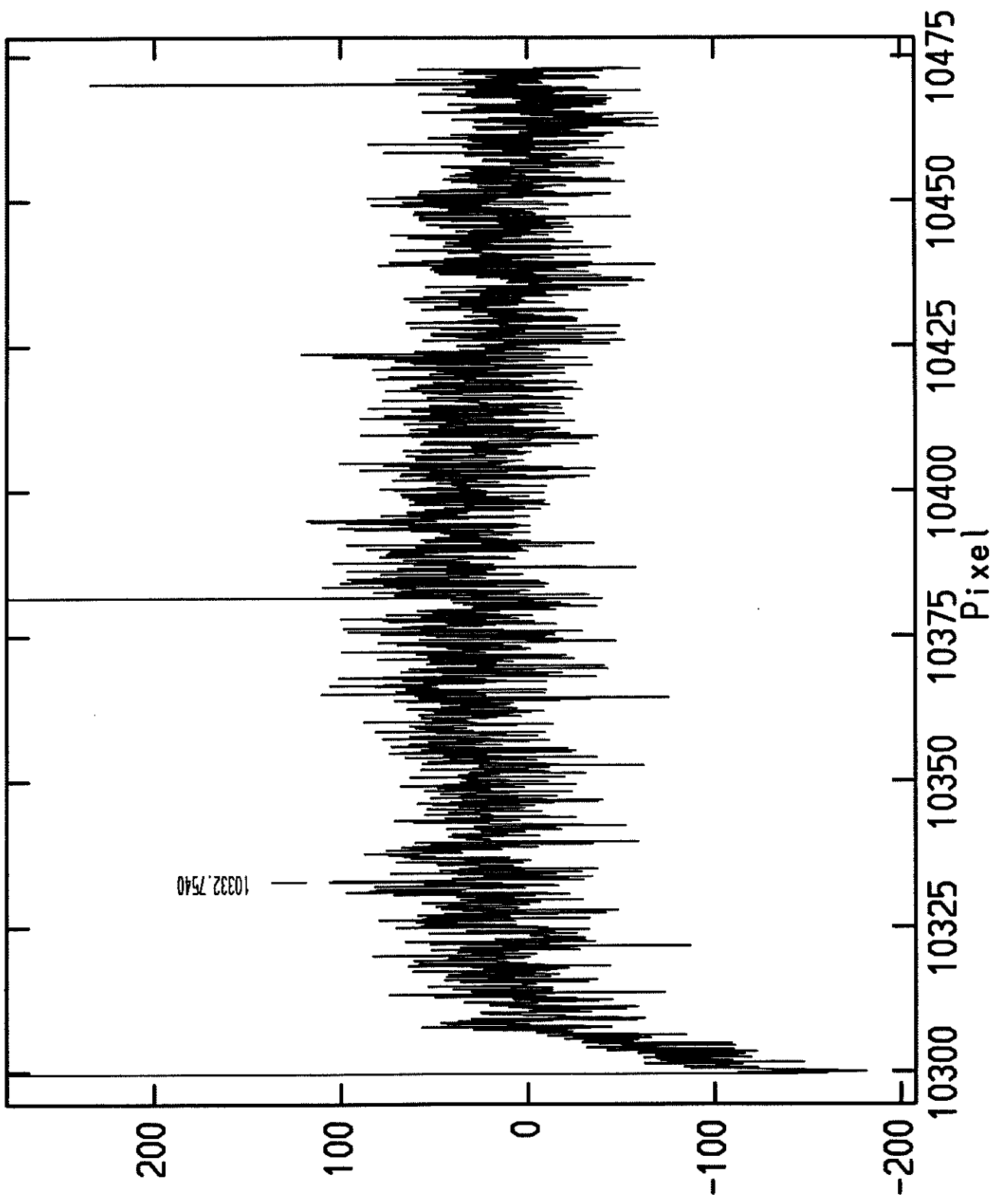
The first two figures show the complete chip before the row mashing. The orders are labeled by tens on the edges. The table lists the wavelength solution obtained by the fit. The fit has an r.m.s scatter of 0.005 A. The reader should remember that the dispersion is for the Ford 2048x2048 chip. This atlas is a finding chart to aid in the identification of orders and initial wavelength calibration, and should not be used as a reference to all of the lines which can be identified in the Hamilton Spectra. Future repairs to the corrector may change the sharpness of the lines and de-blend some close pairs, but the relative strengths of the lines probably will not change.

thar0066.fbb1 - th/ar
(IRRF)

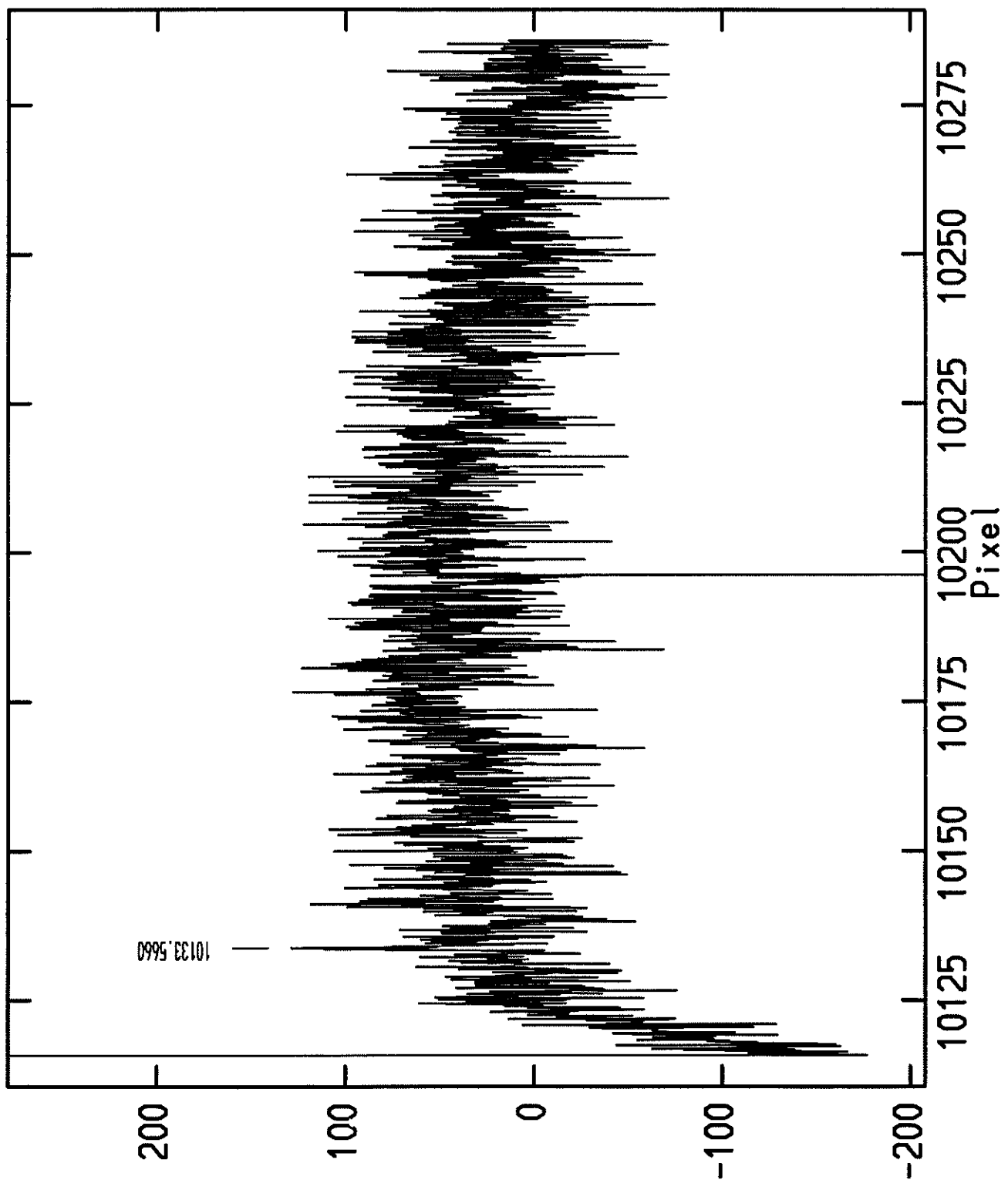


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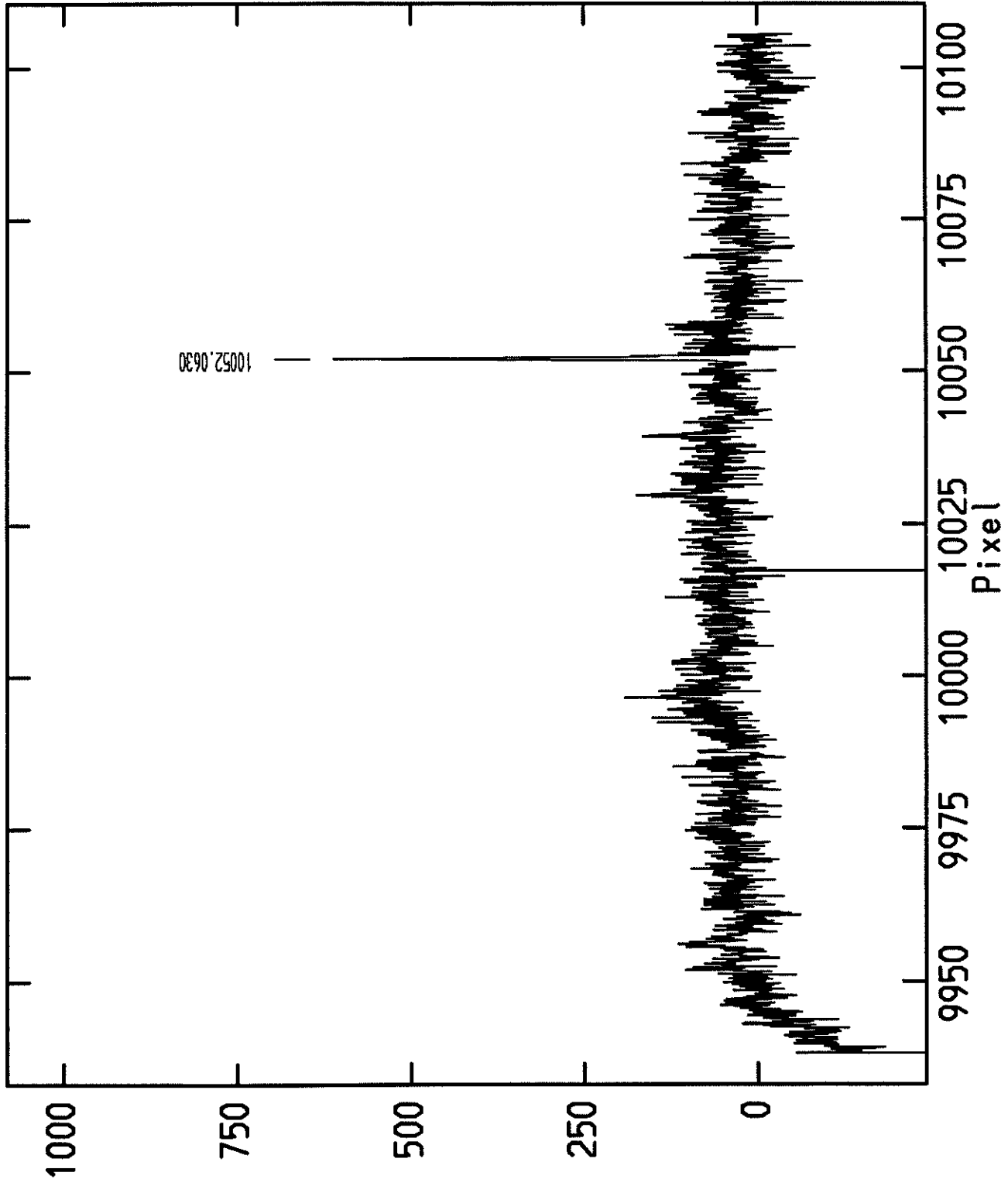
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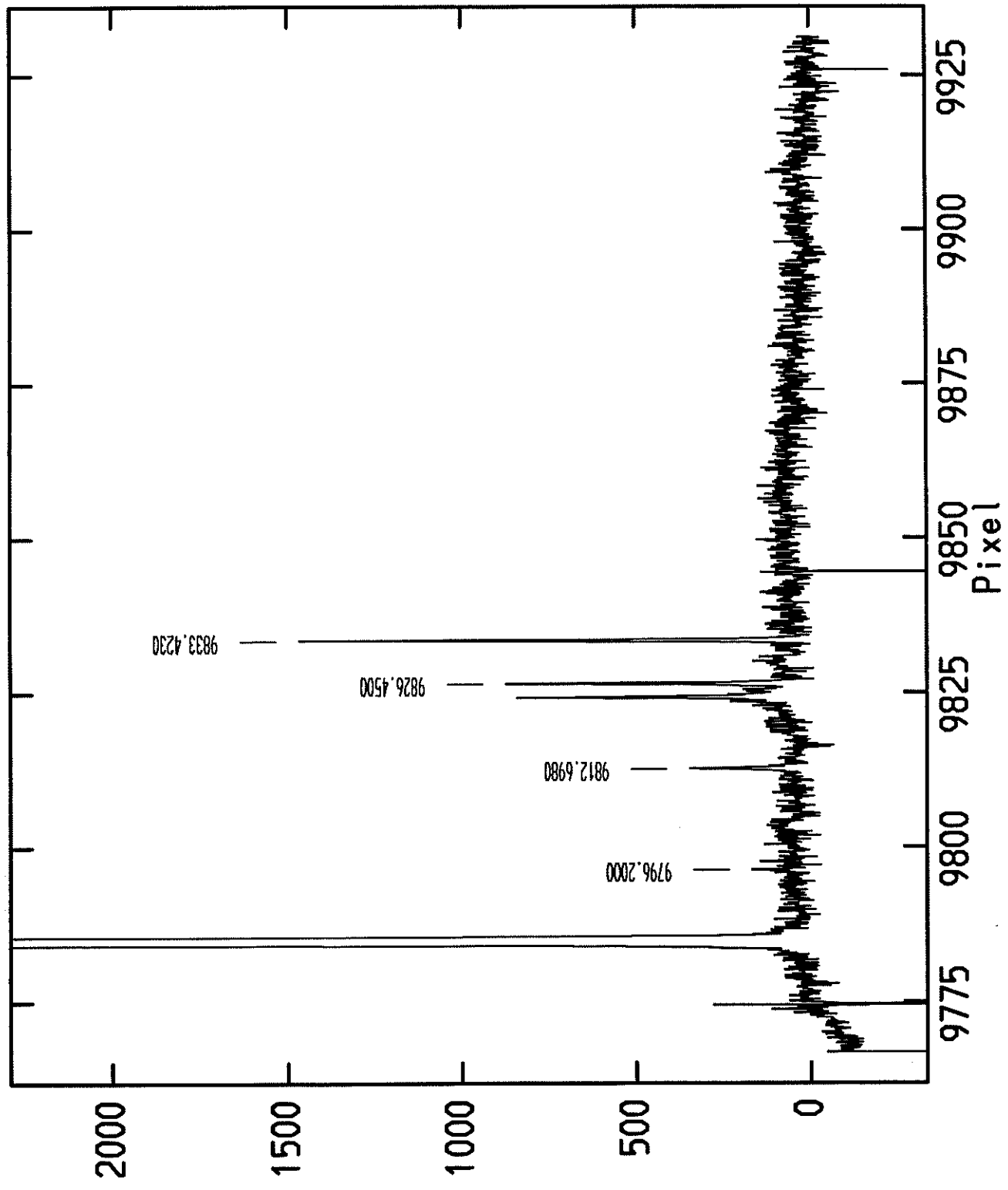
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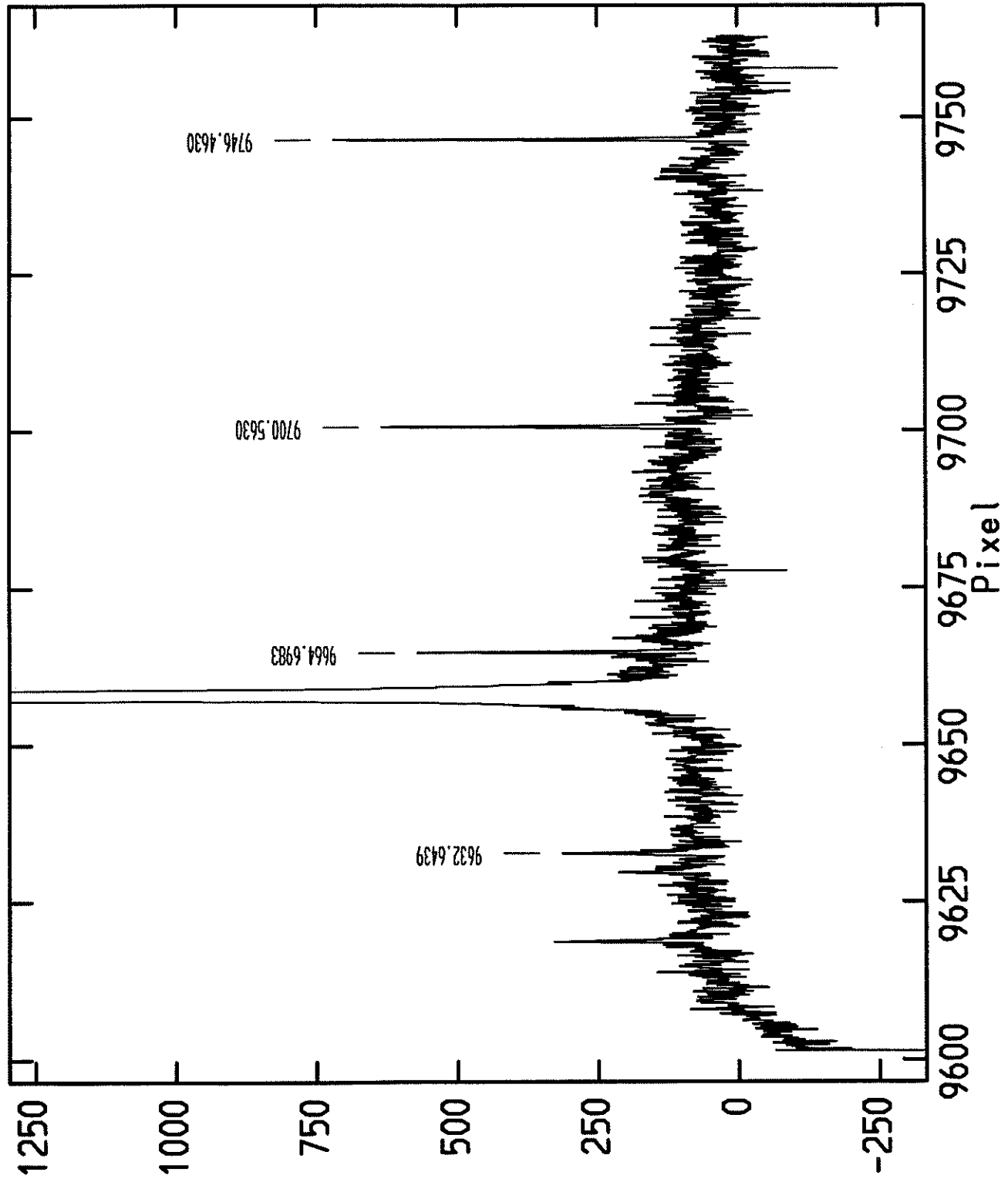
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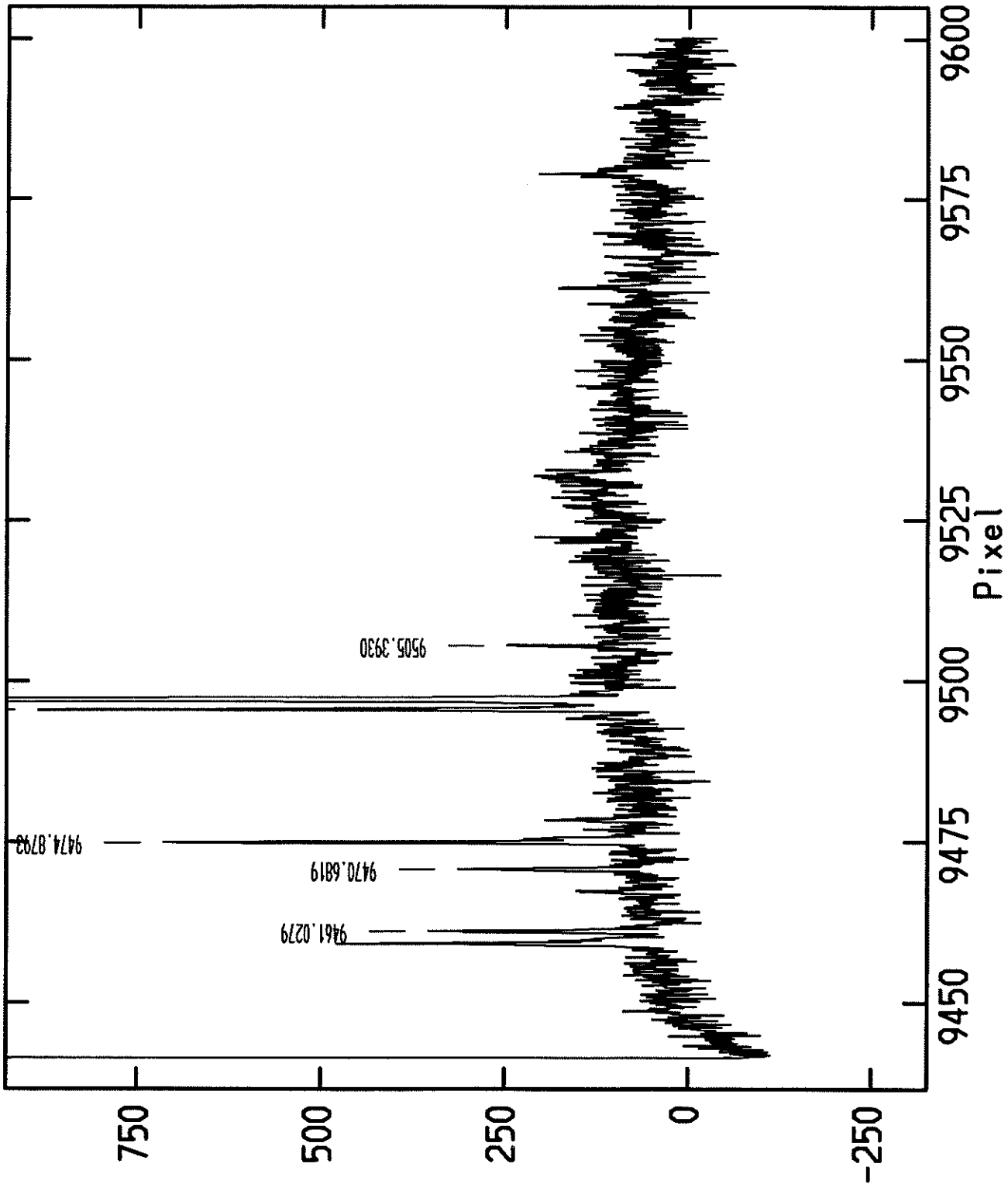
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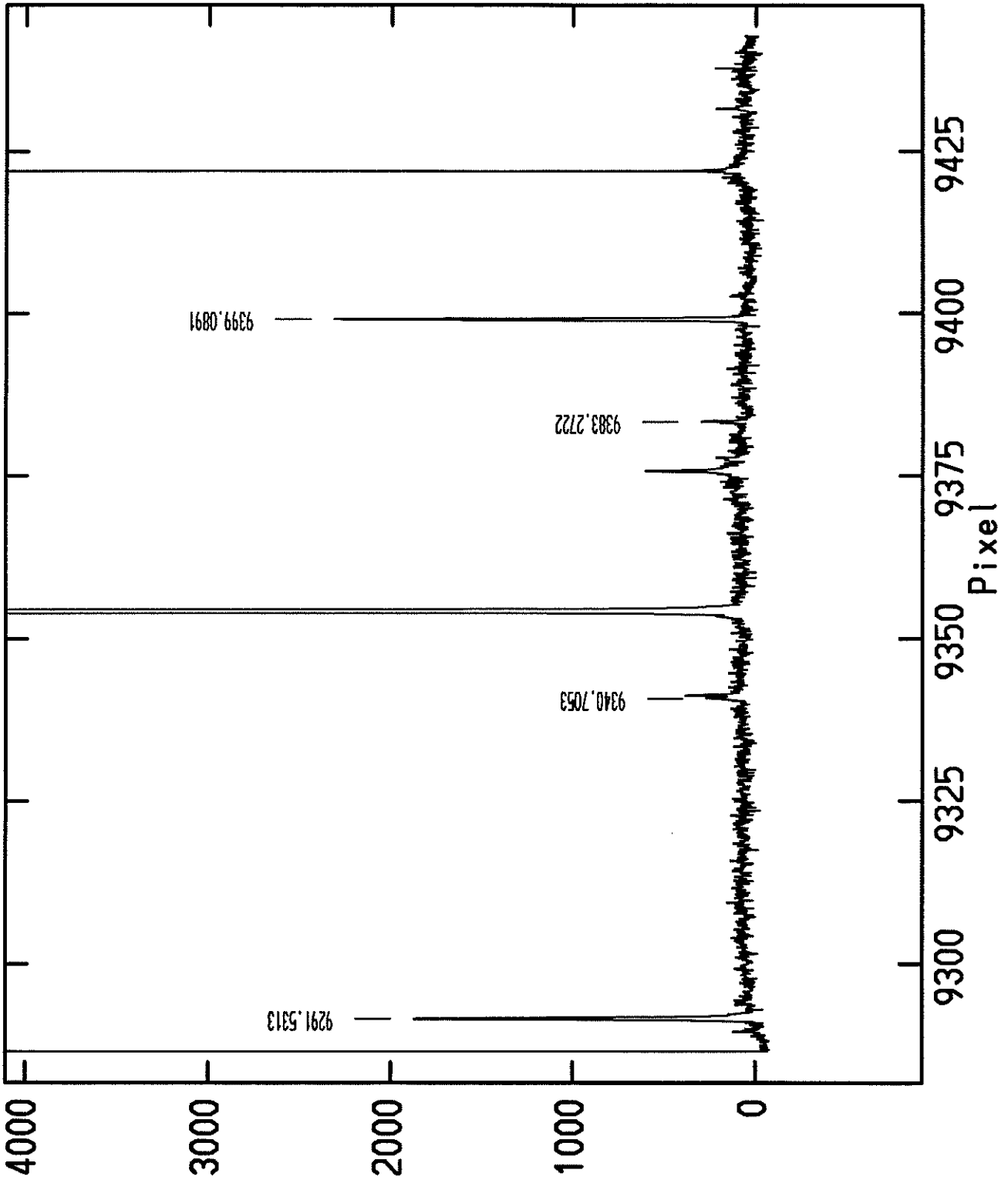
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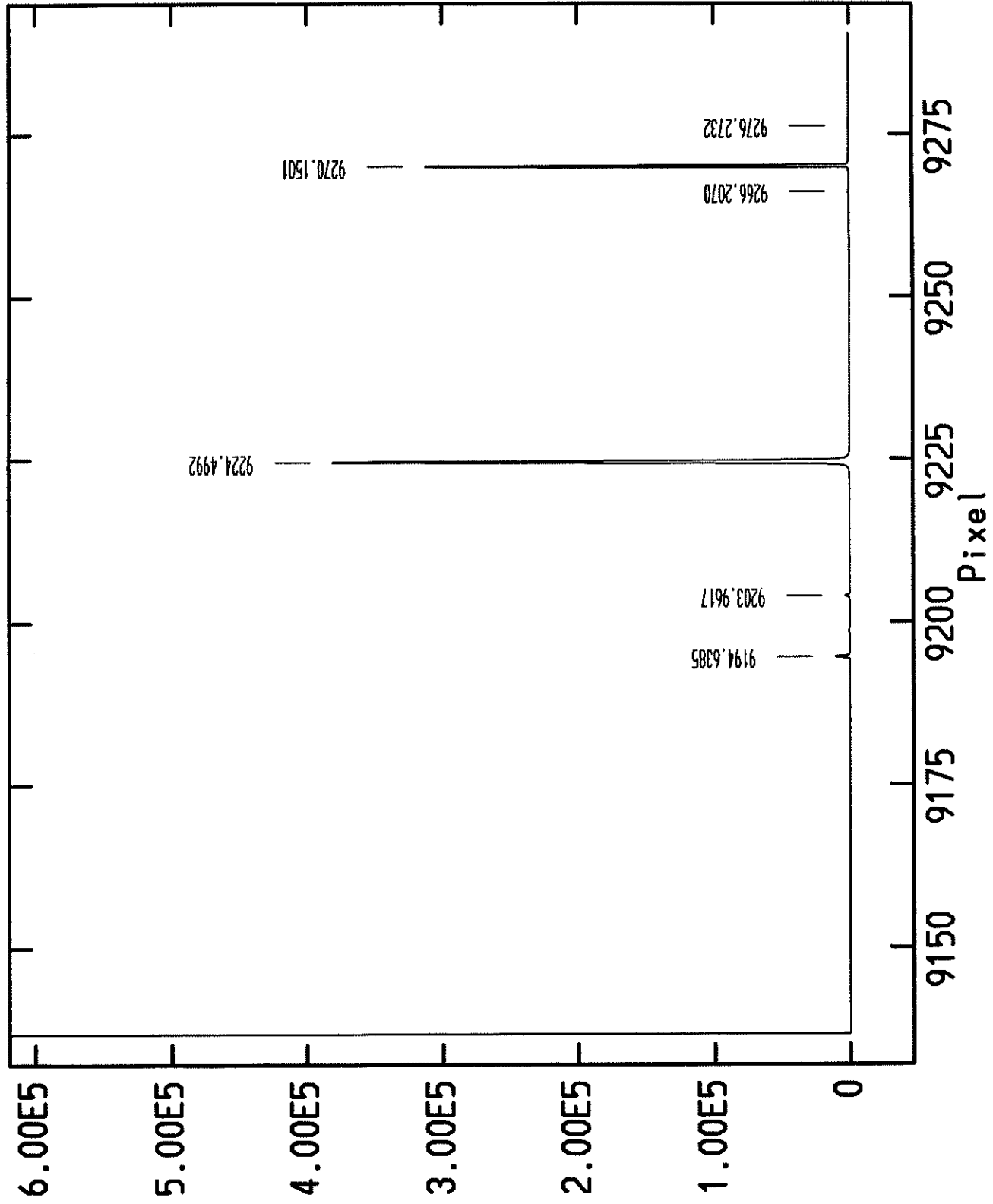


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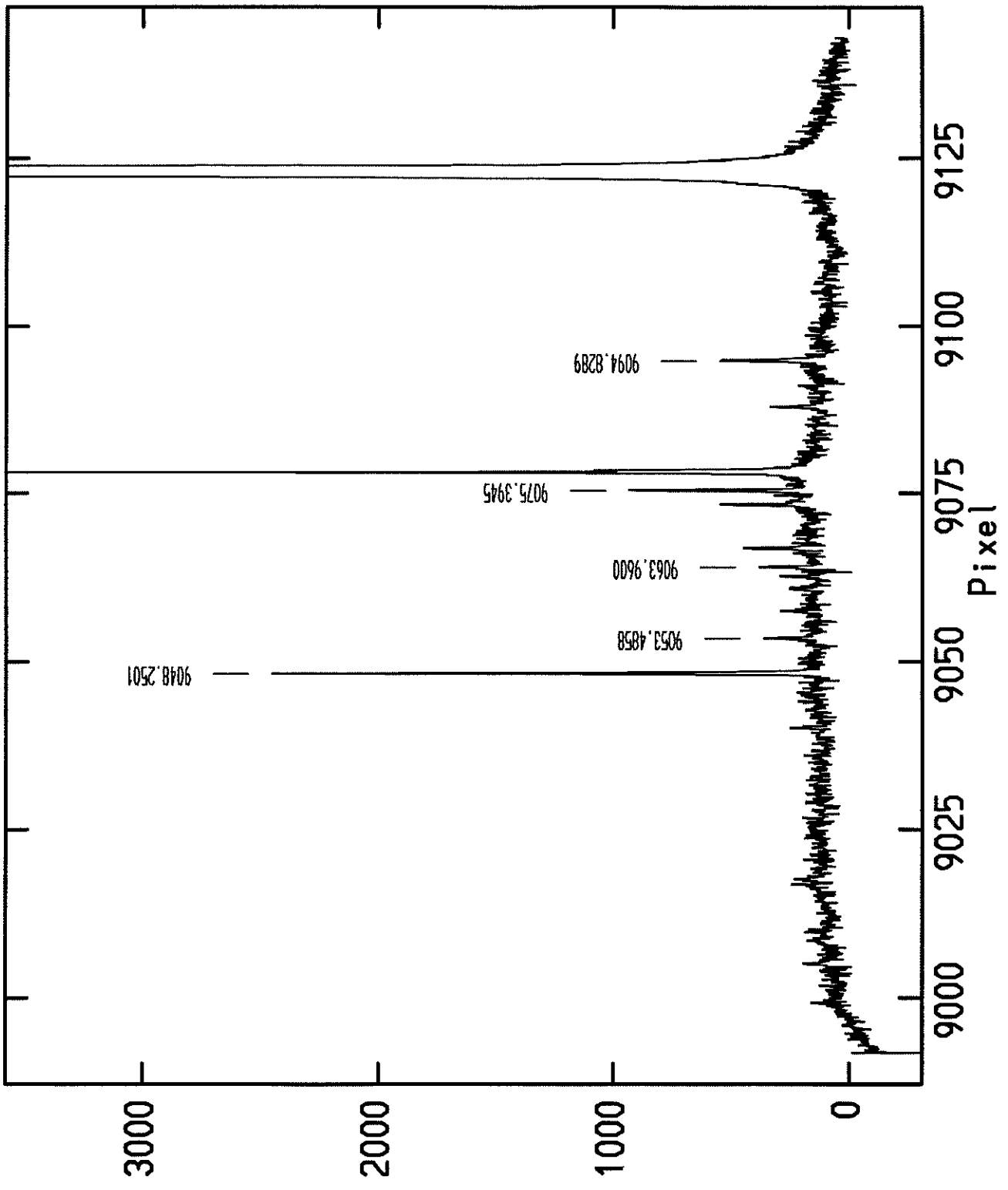


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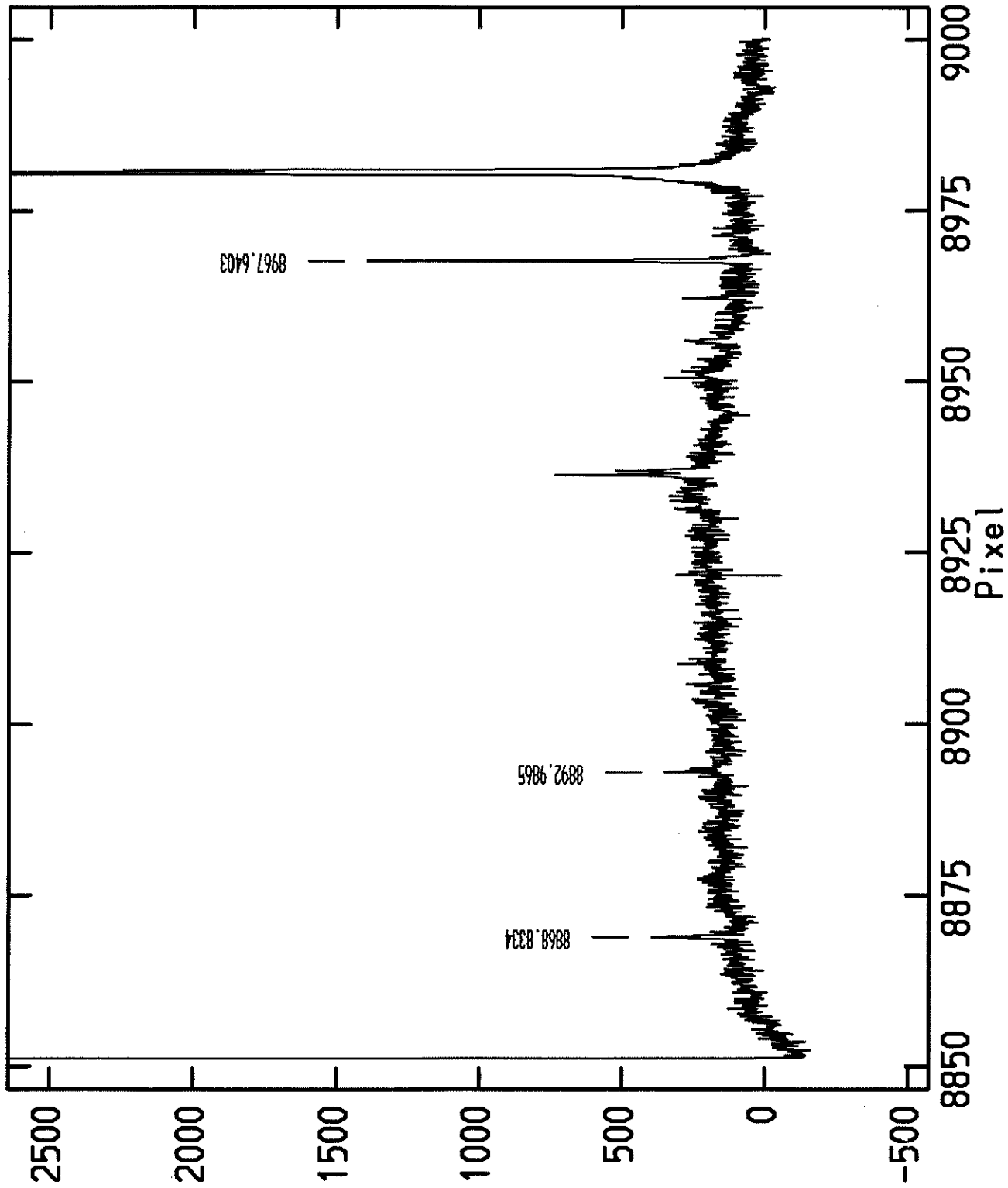


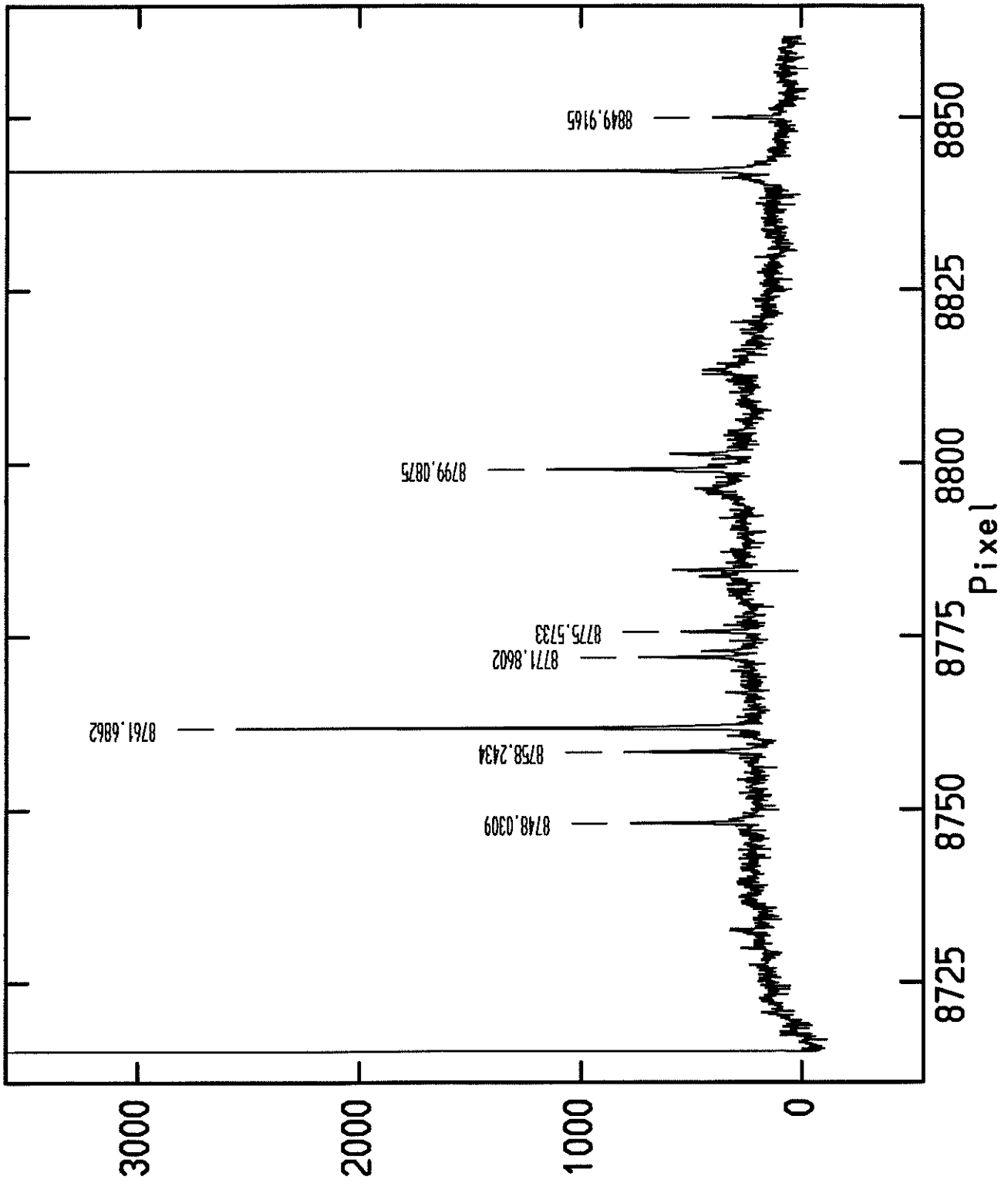


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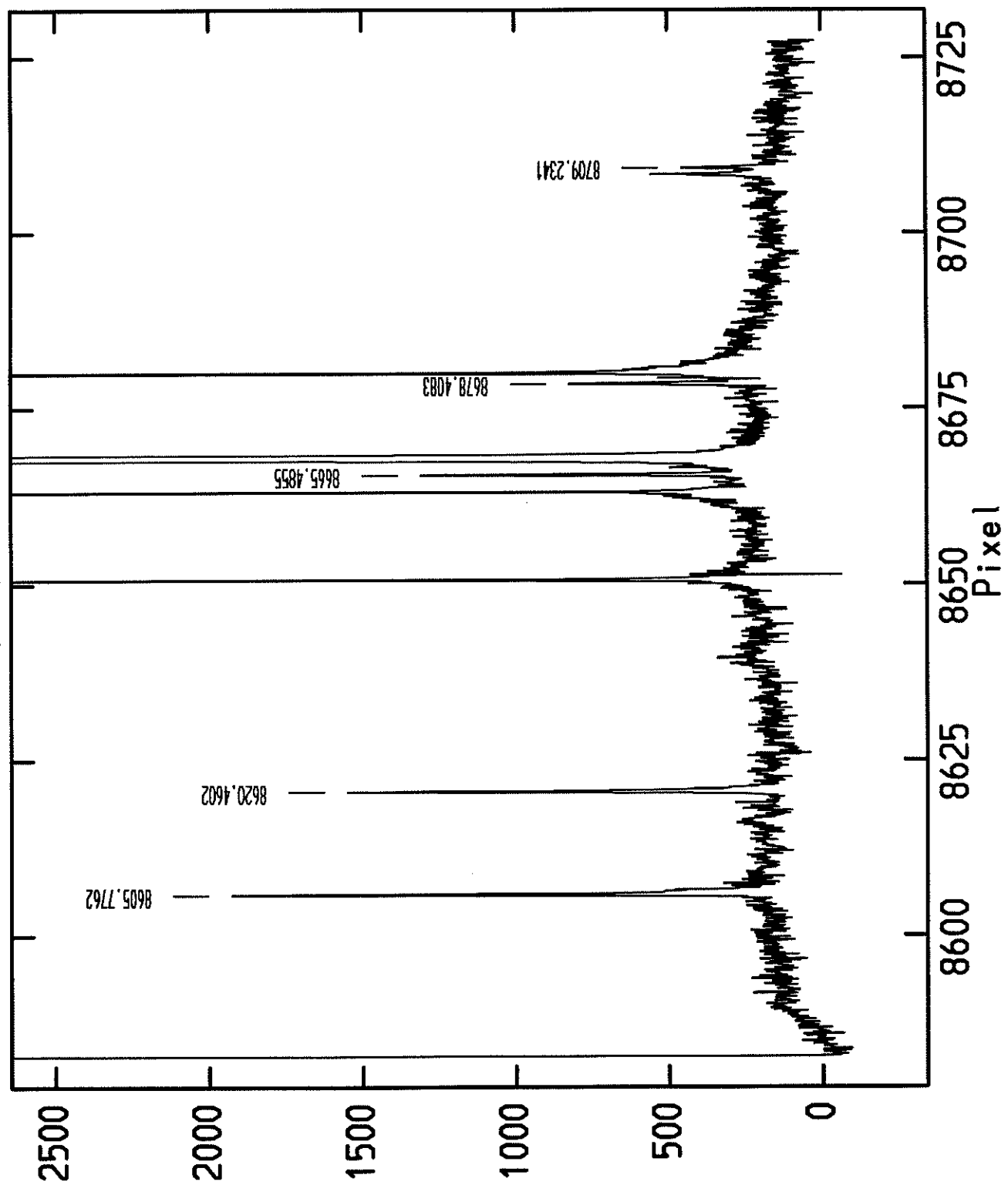


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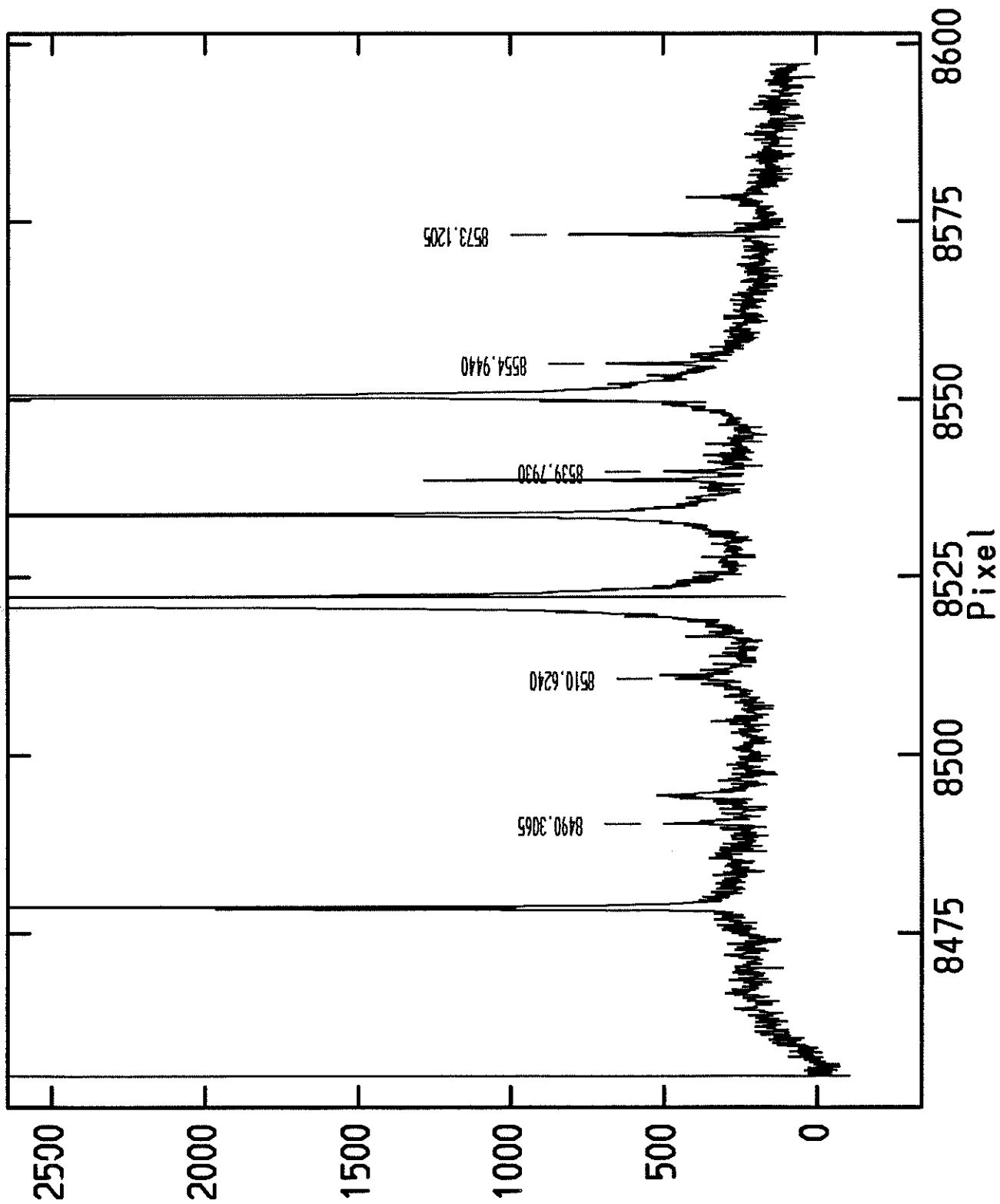


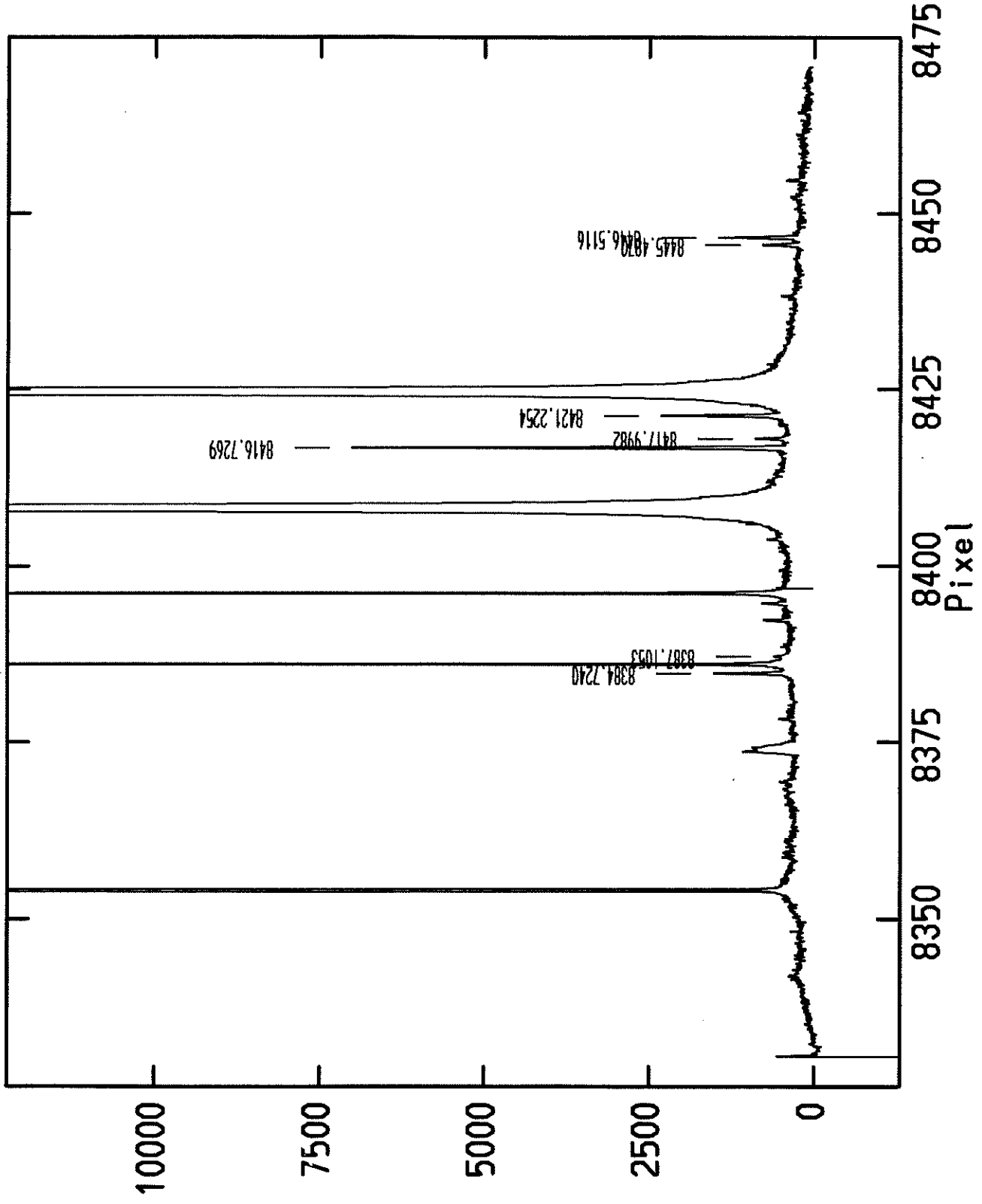


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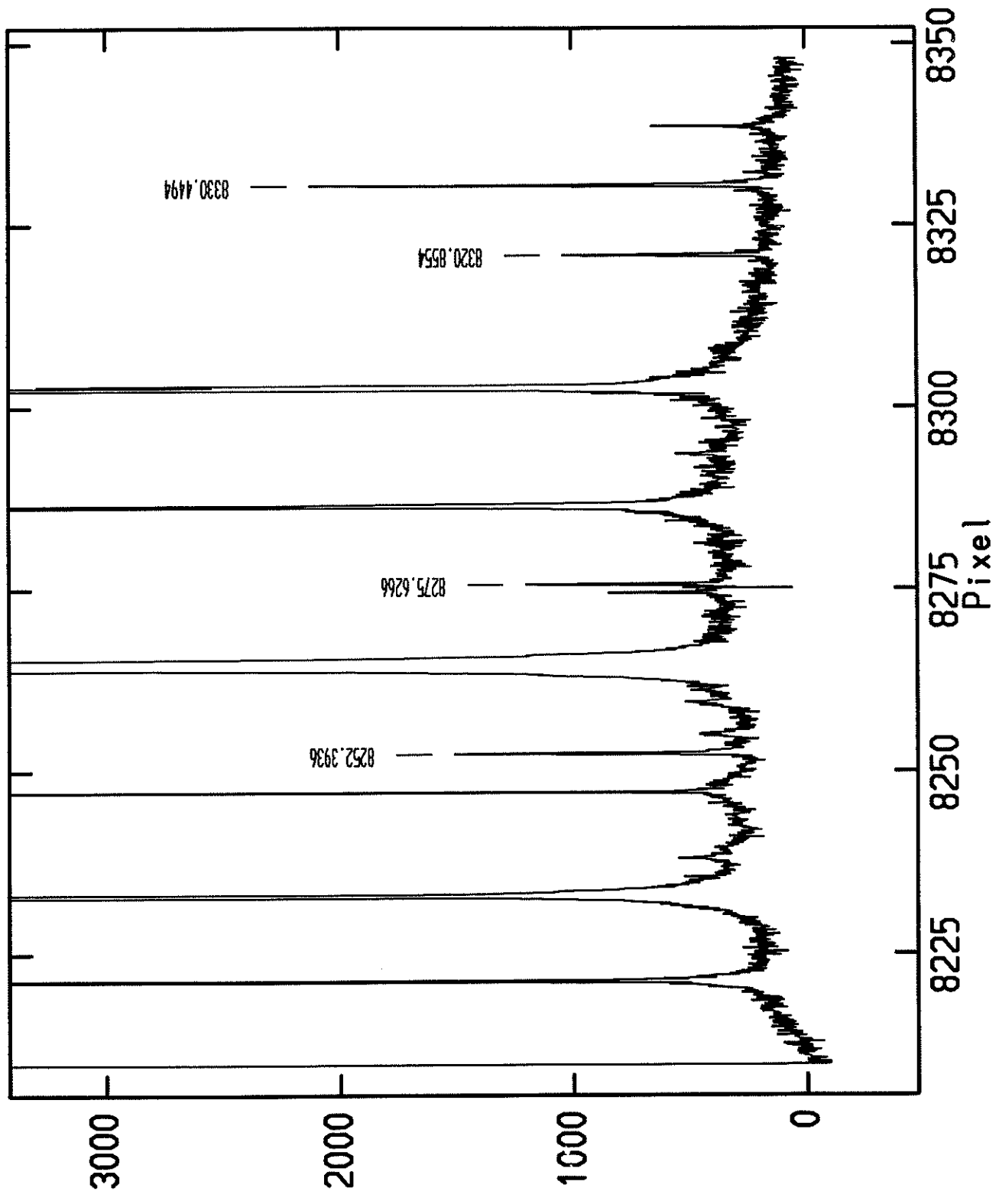


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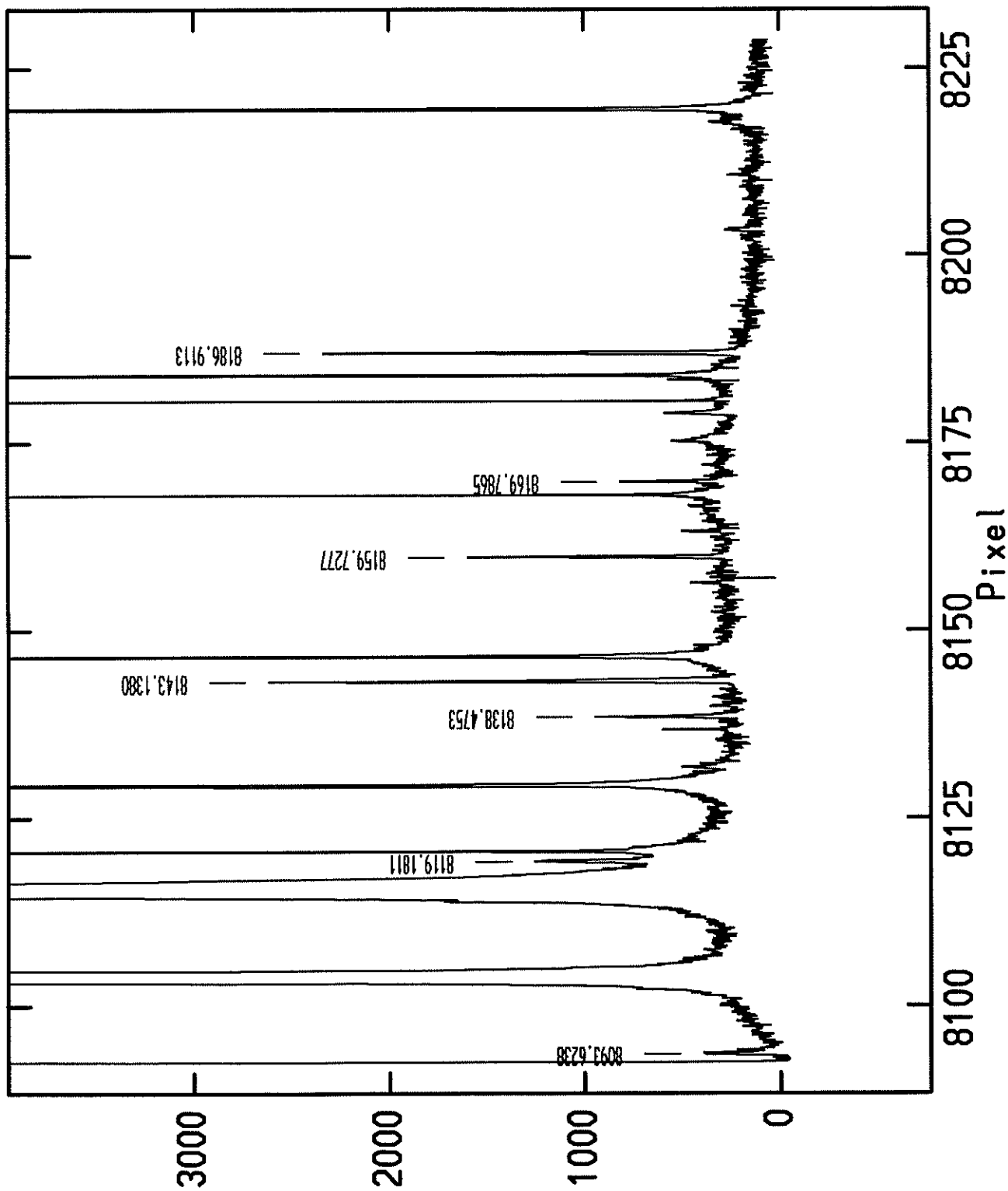


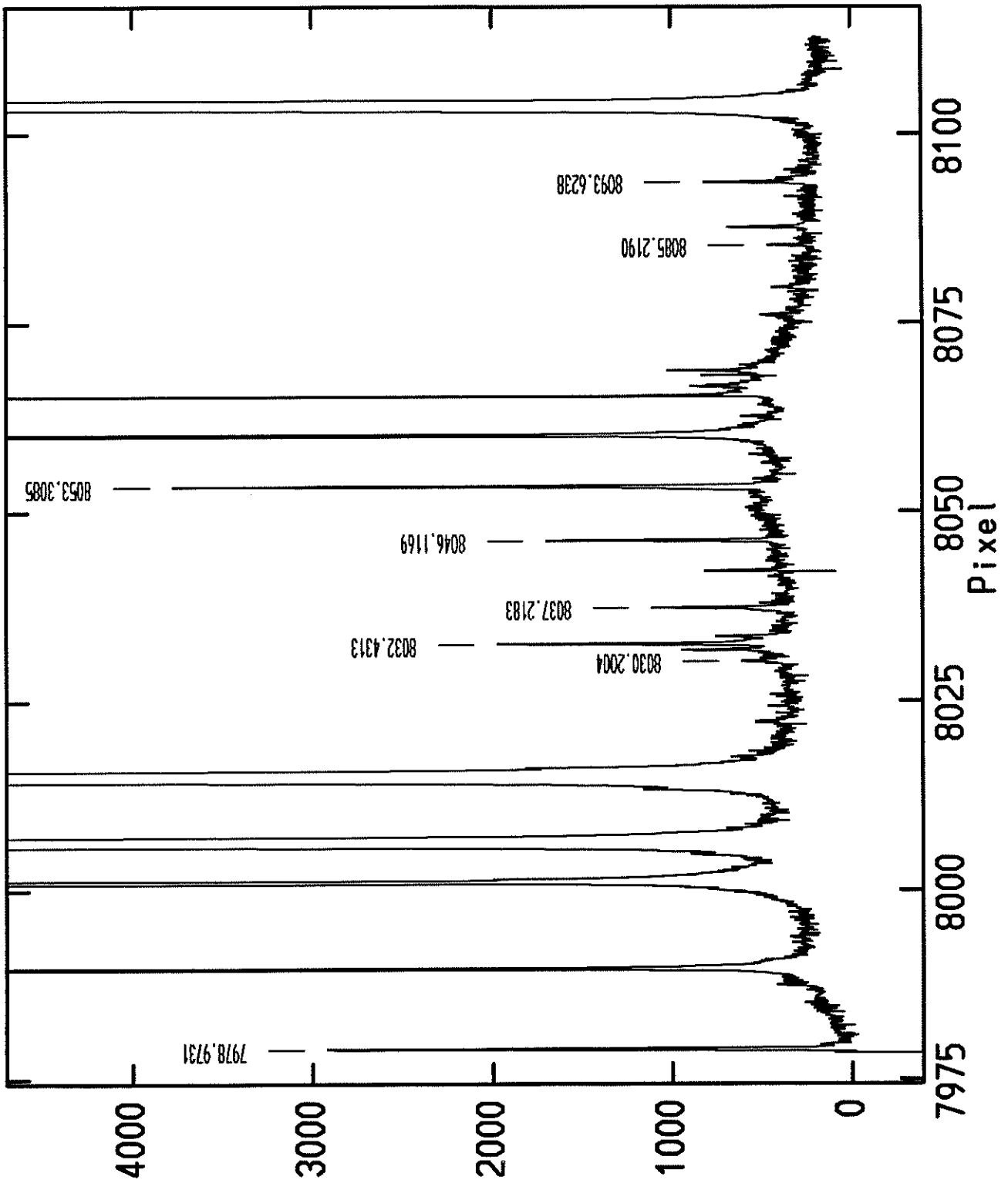


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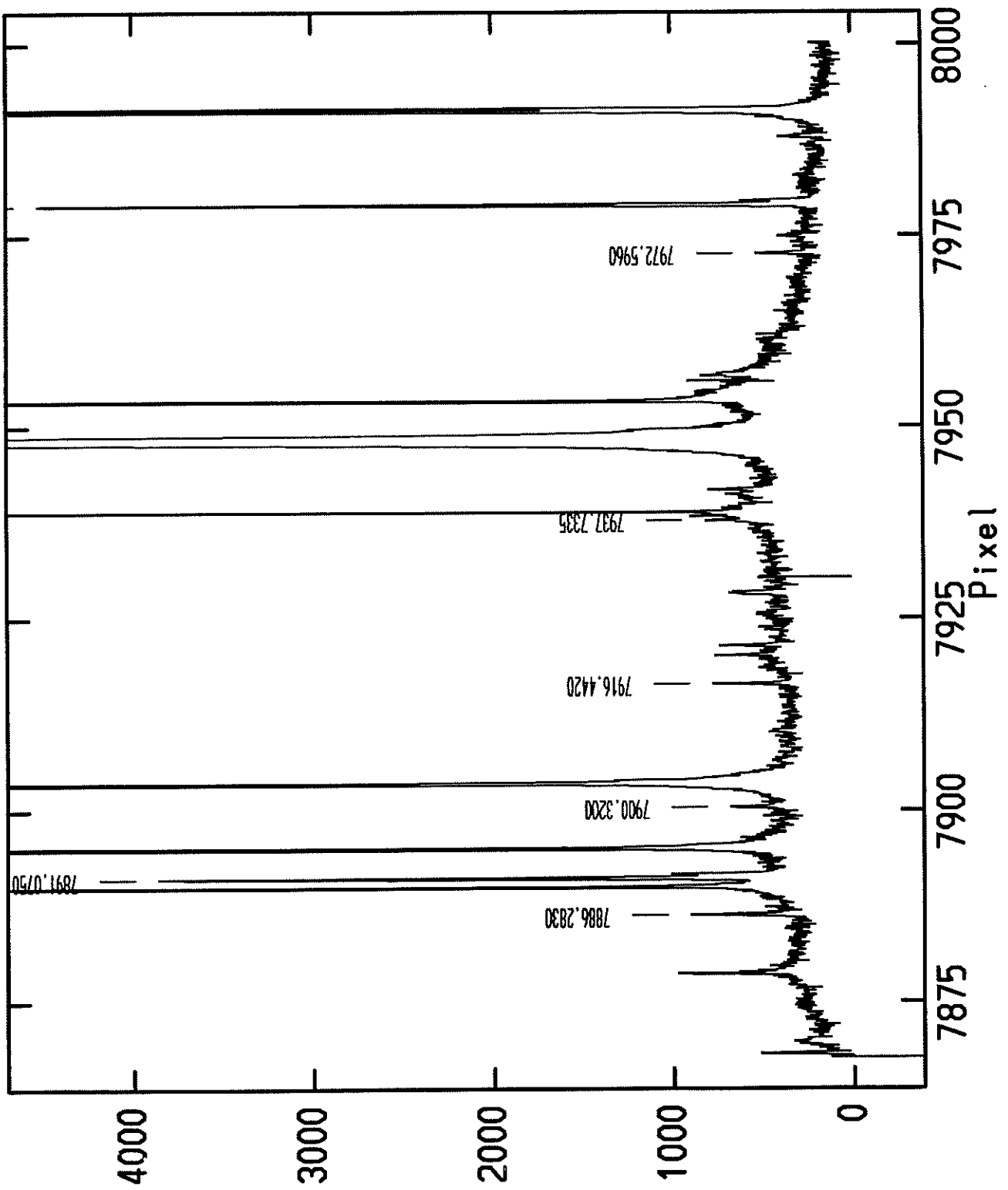


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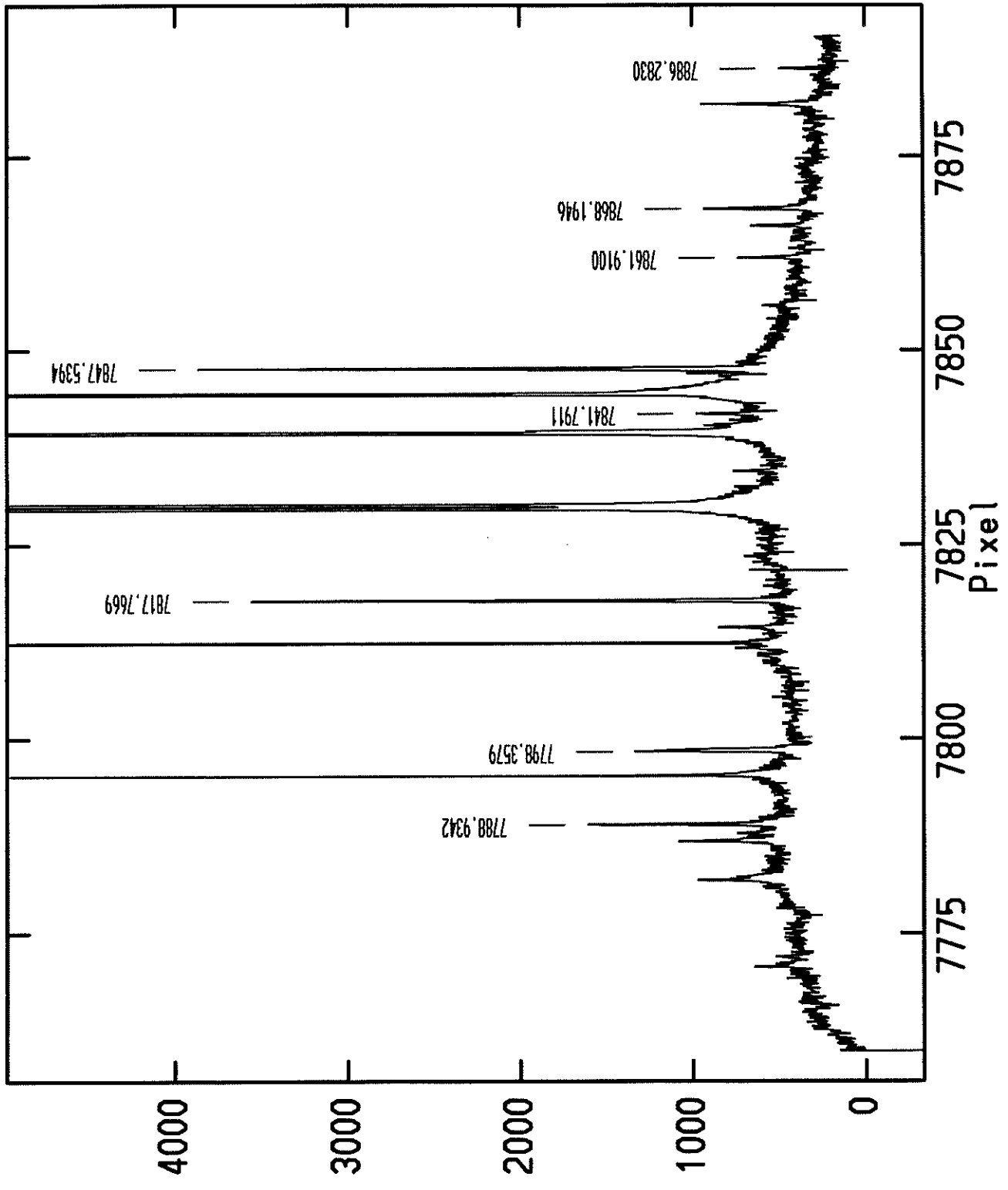




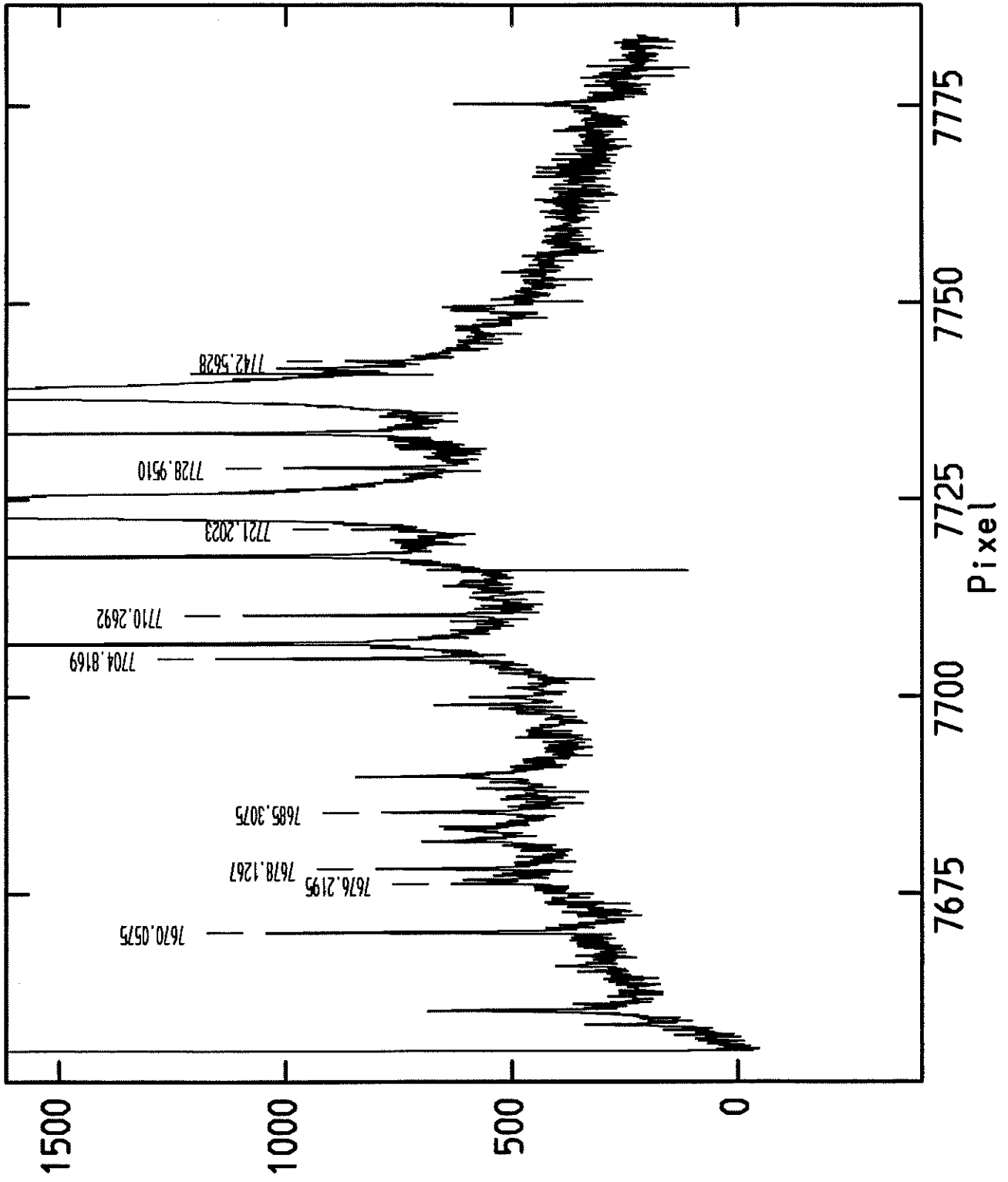
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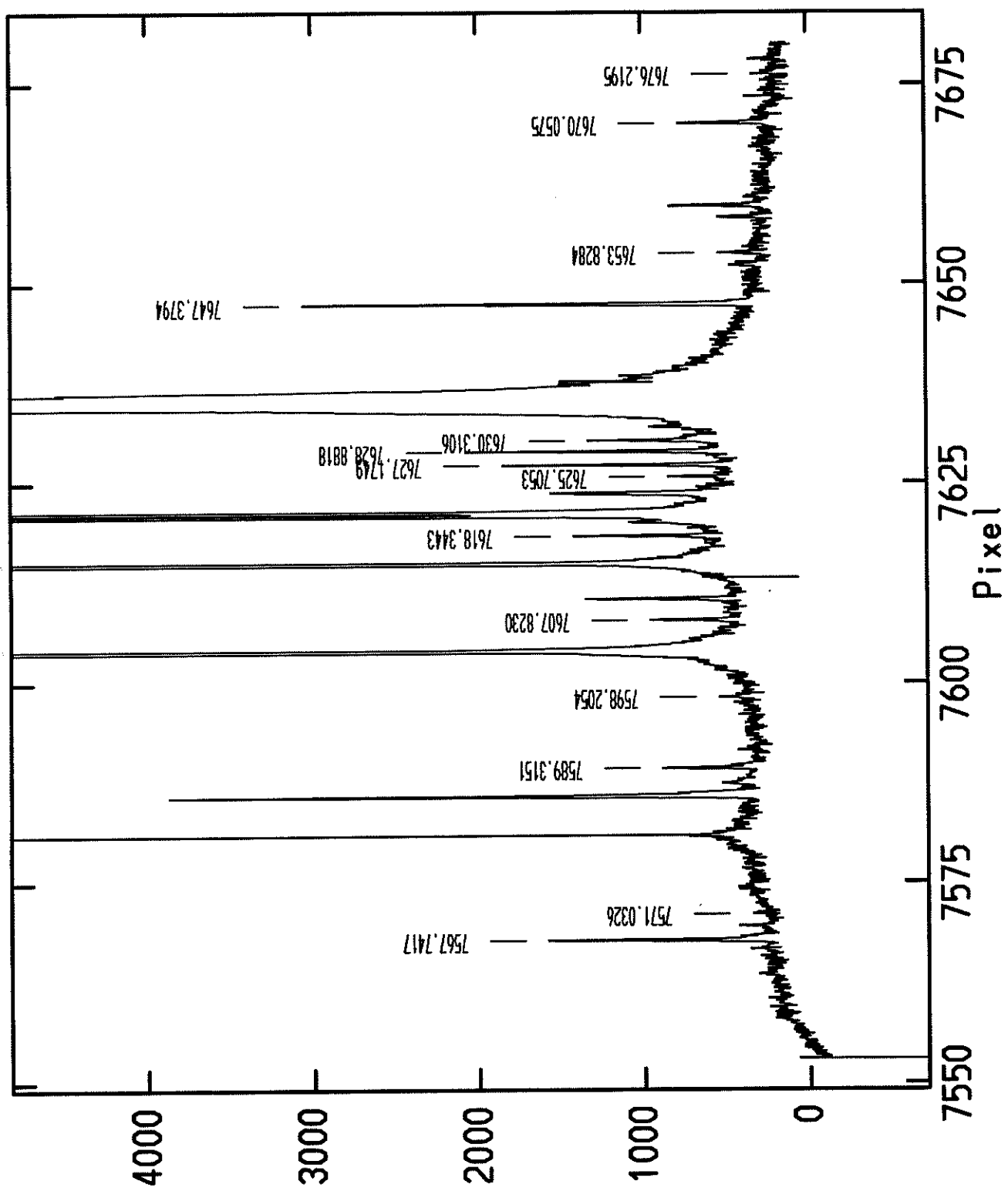


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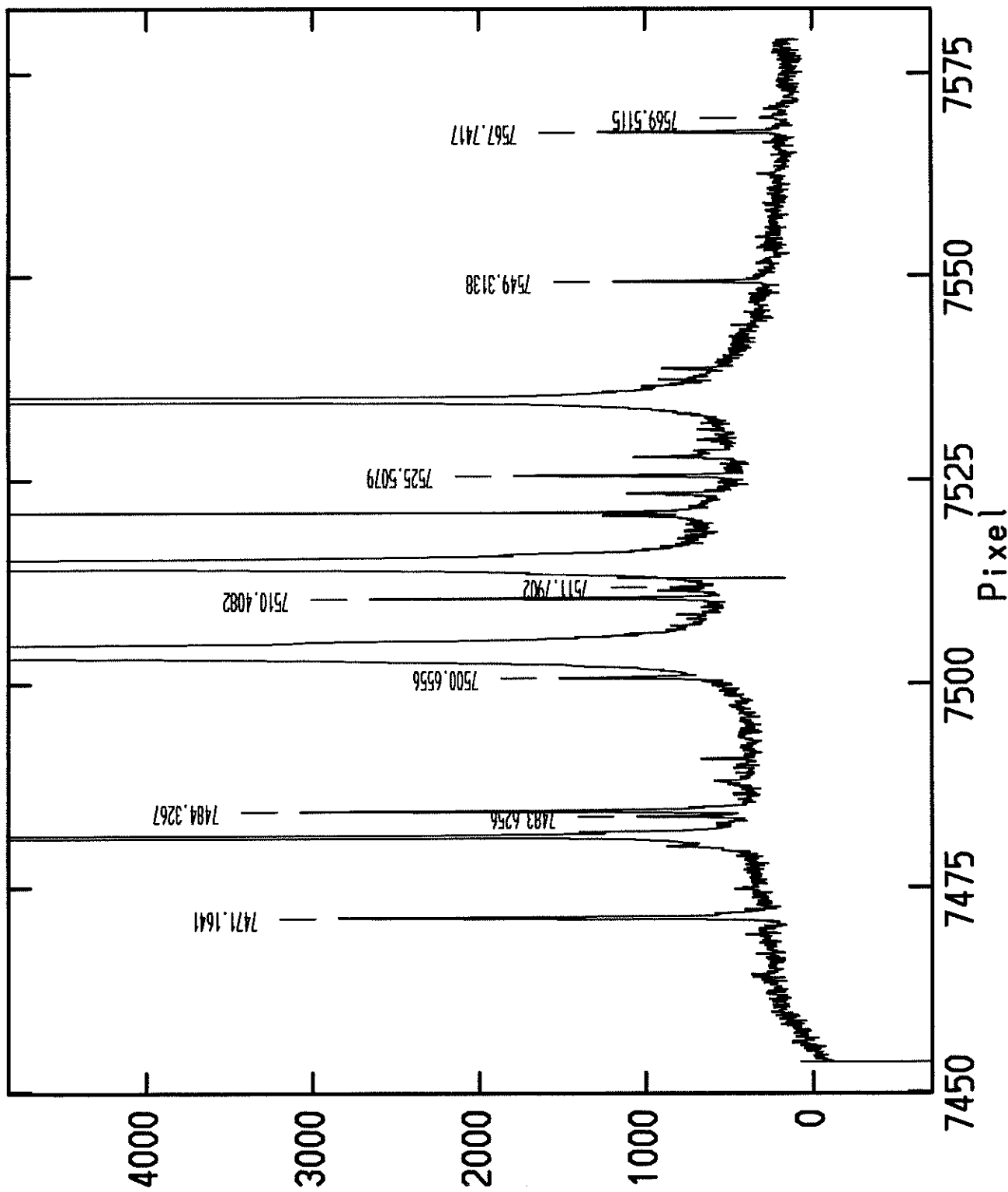


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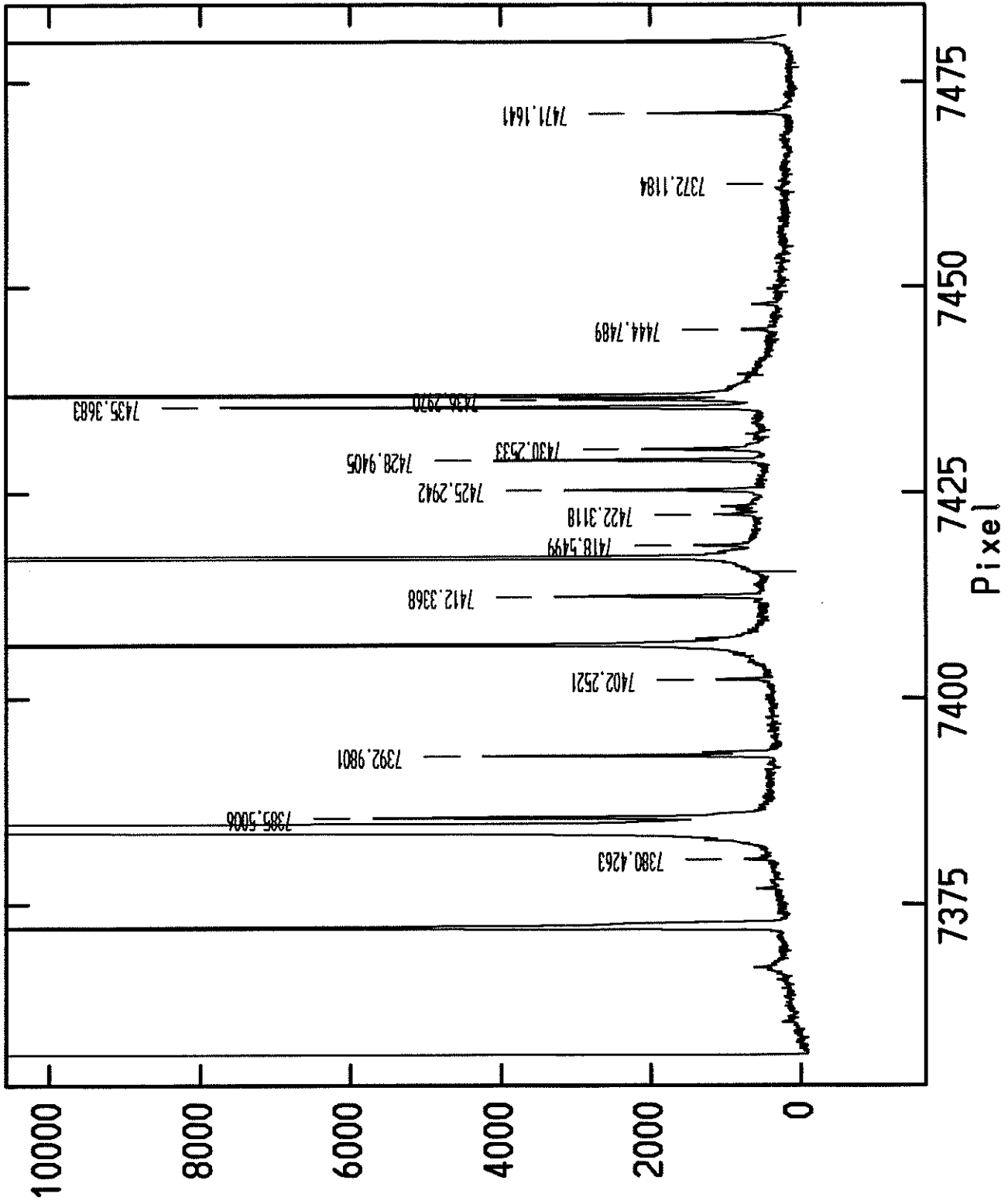




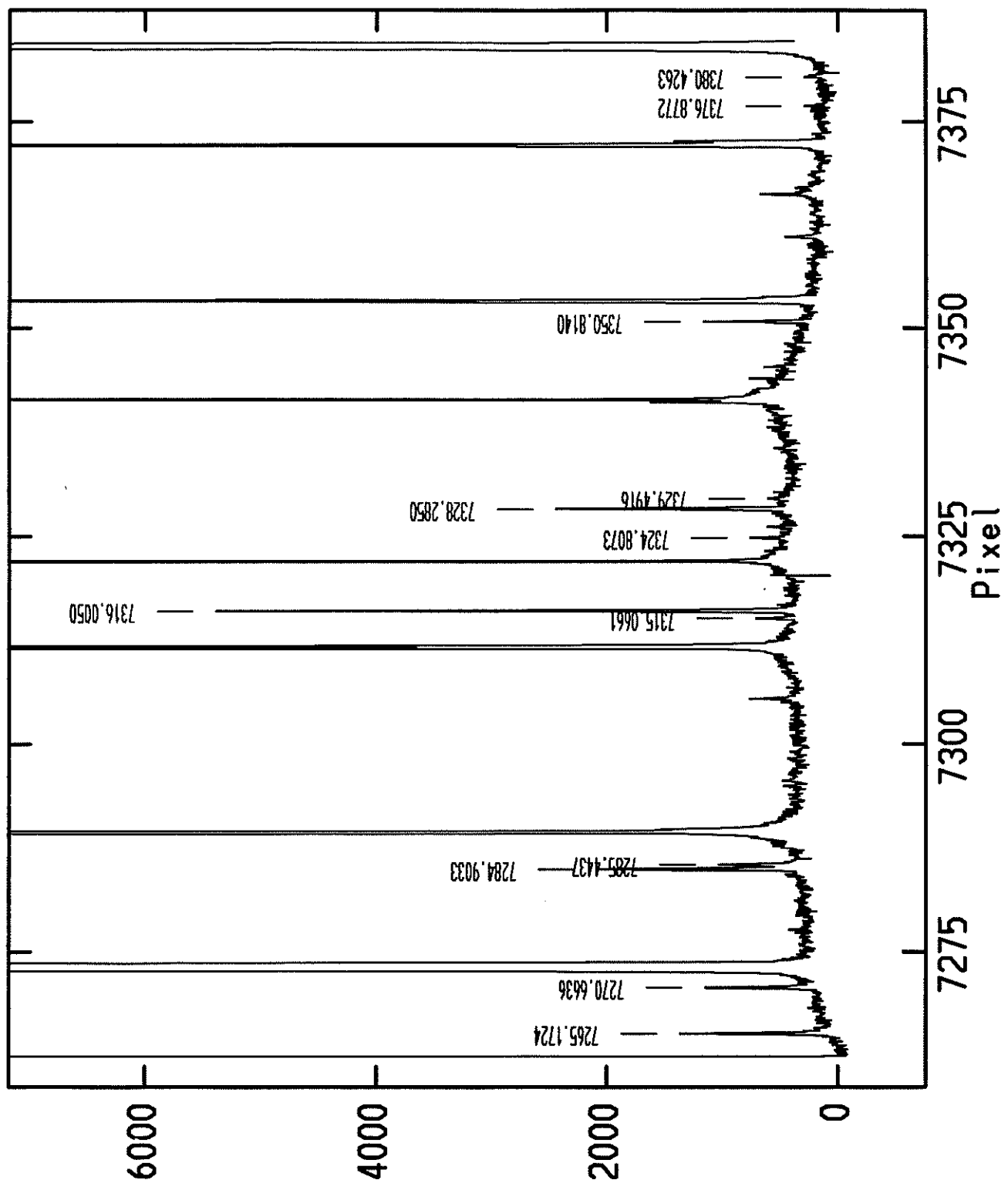
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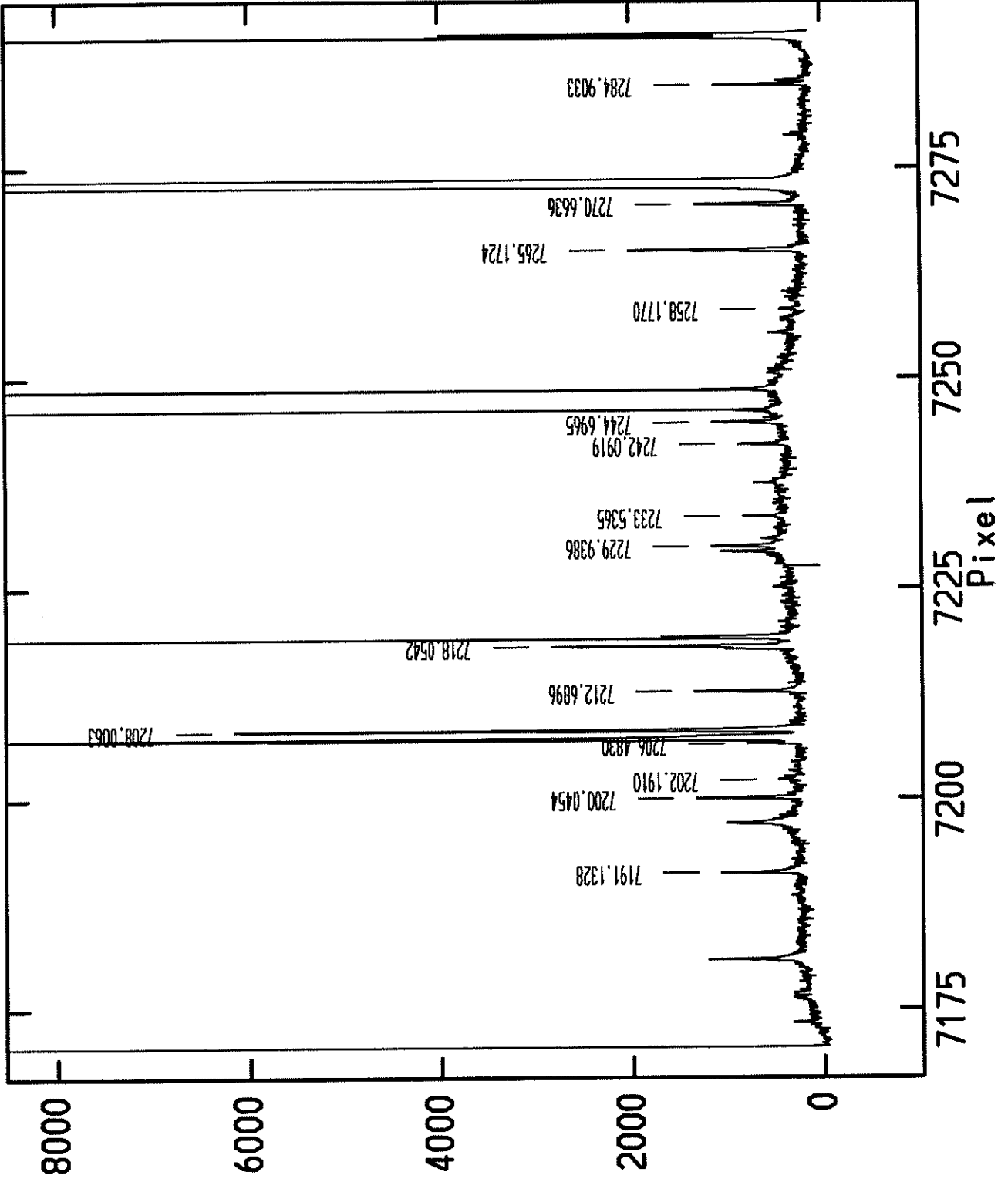
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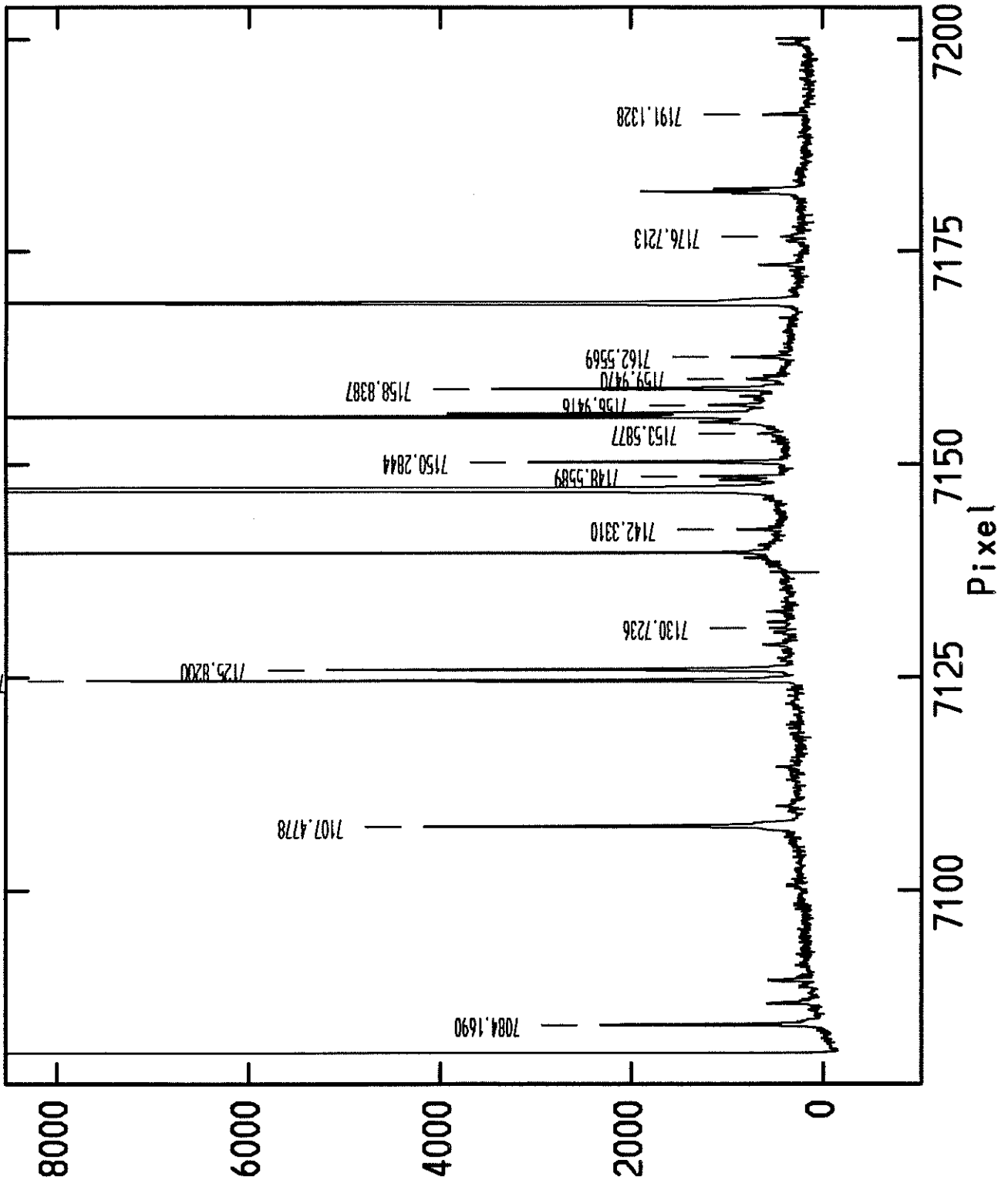
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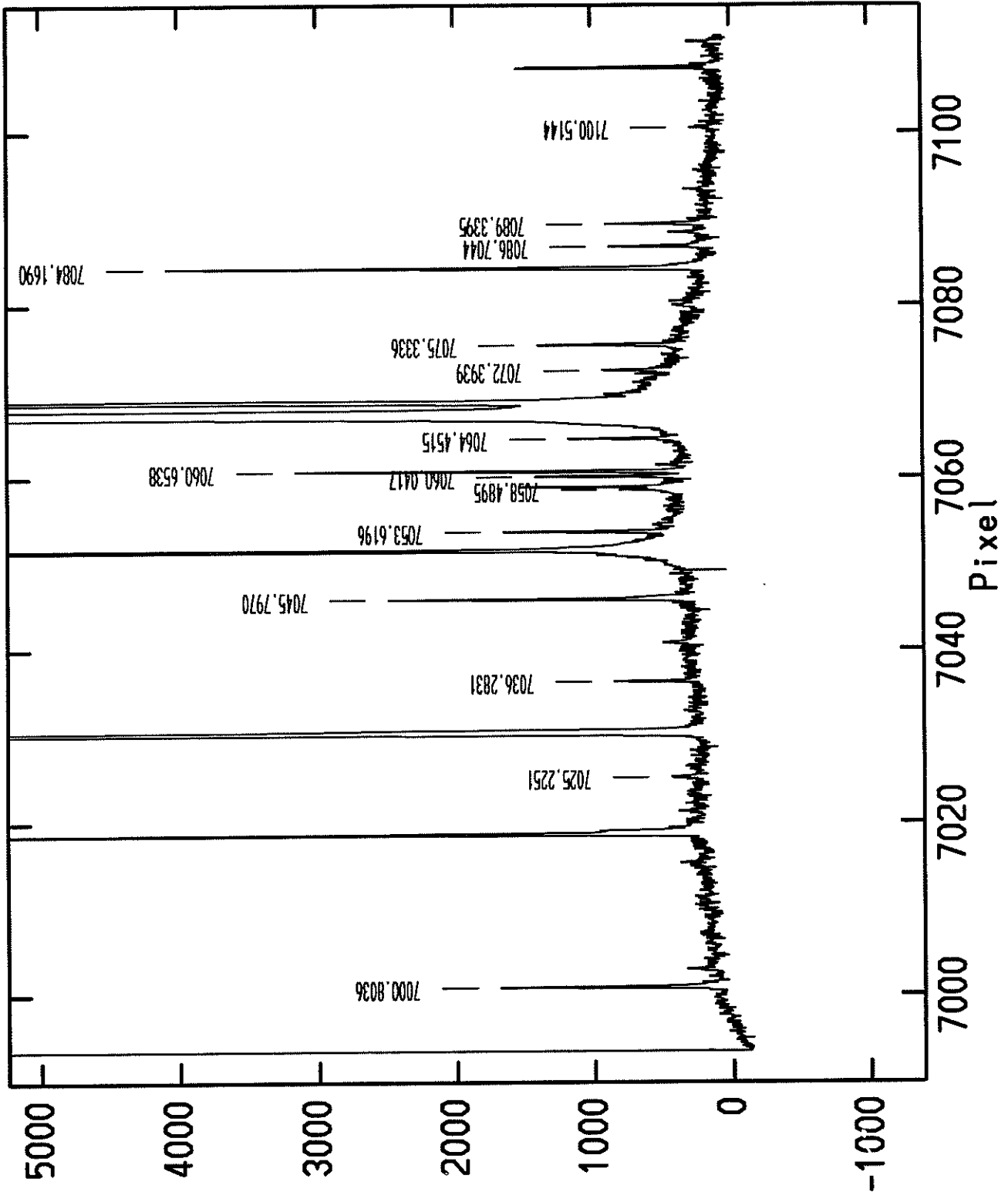
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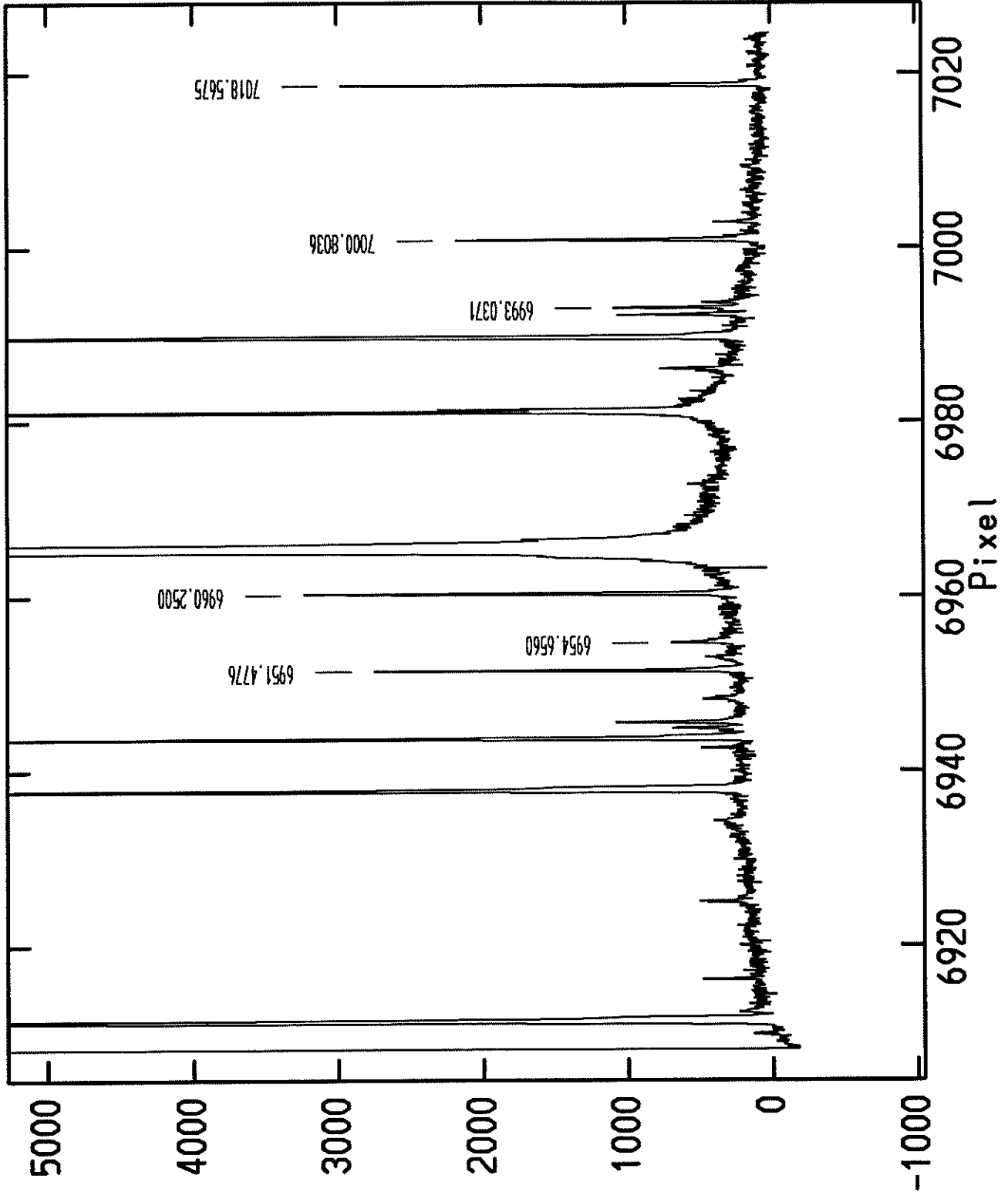
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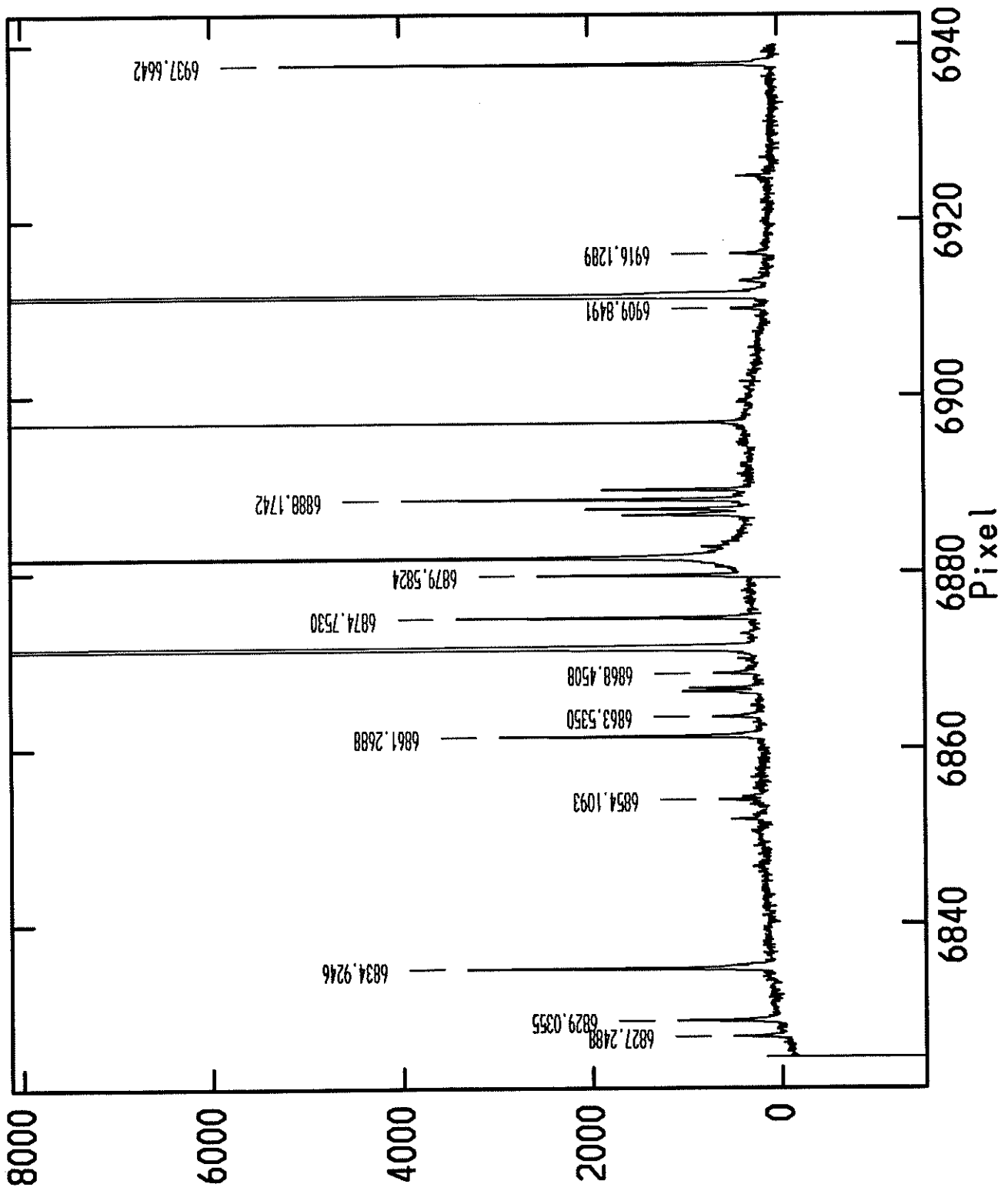


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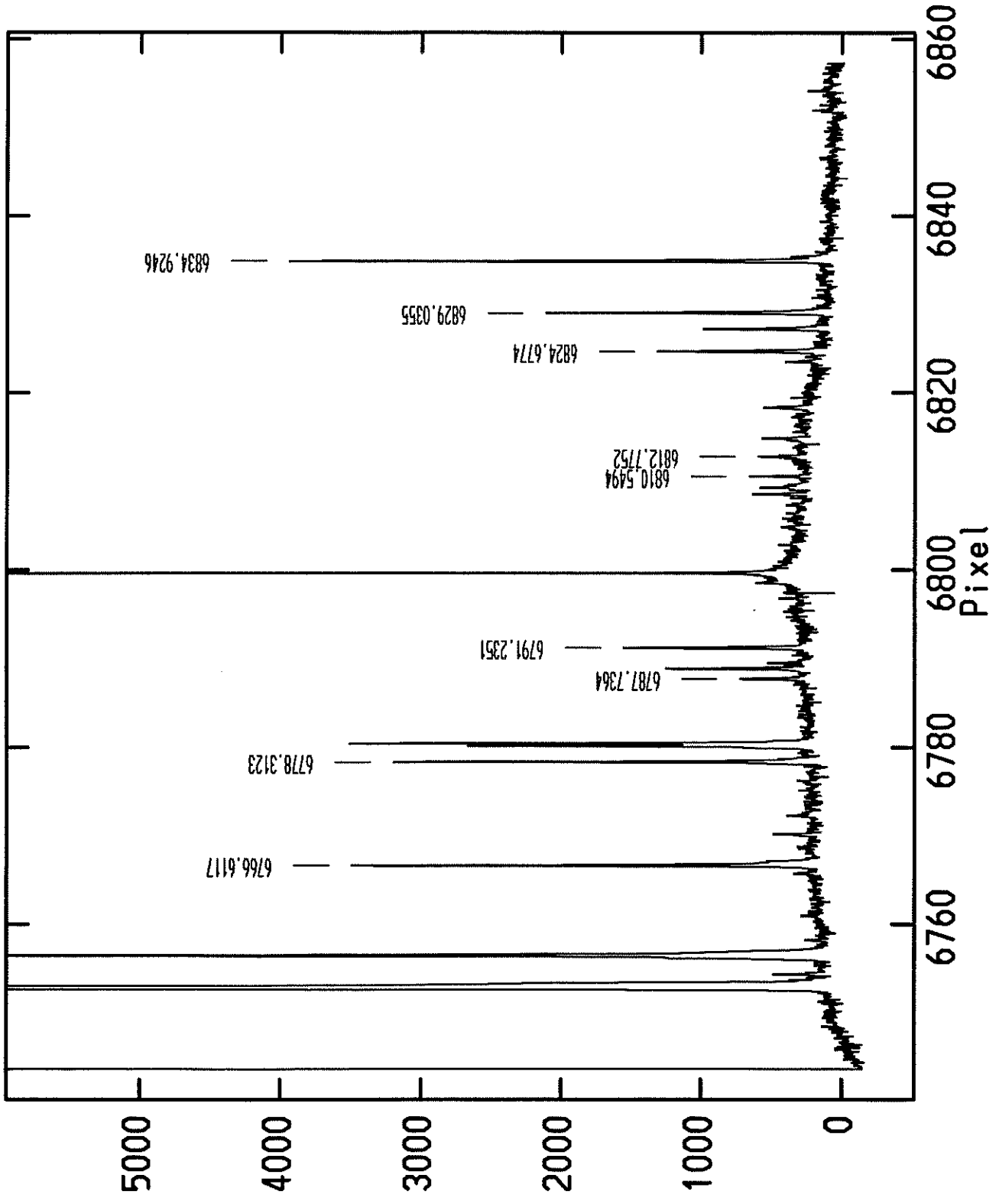


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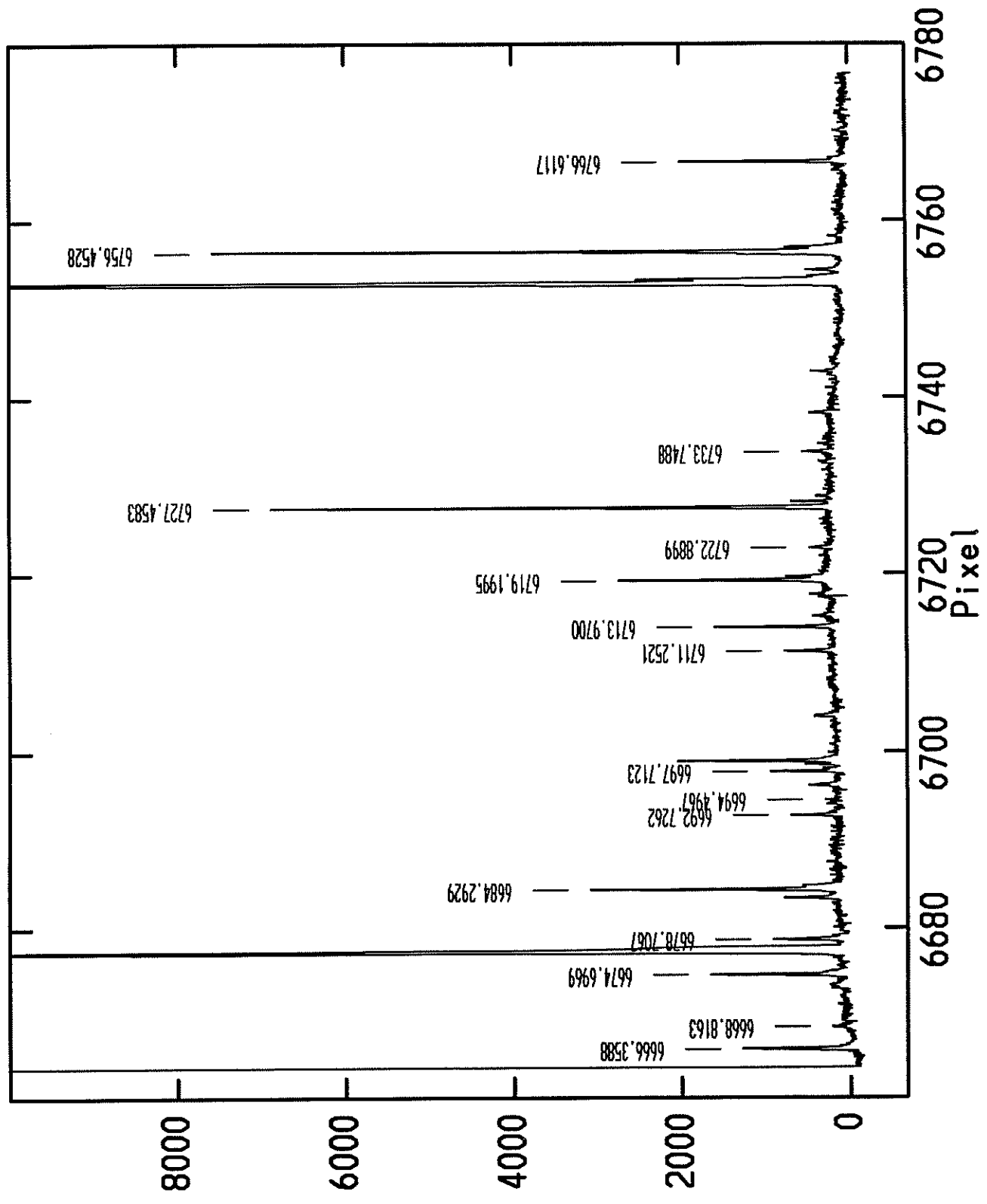




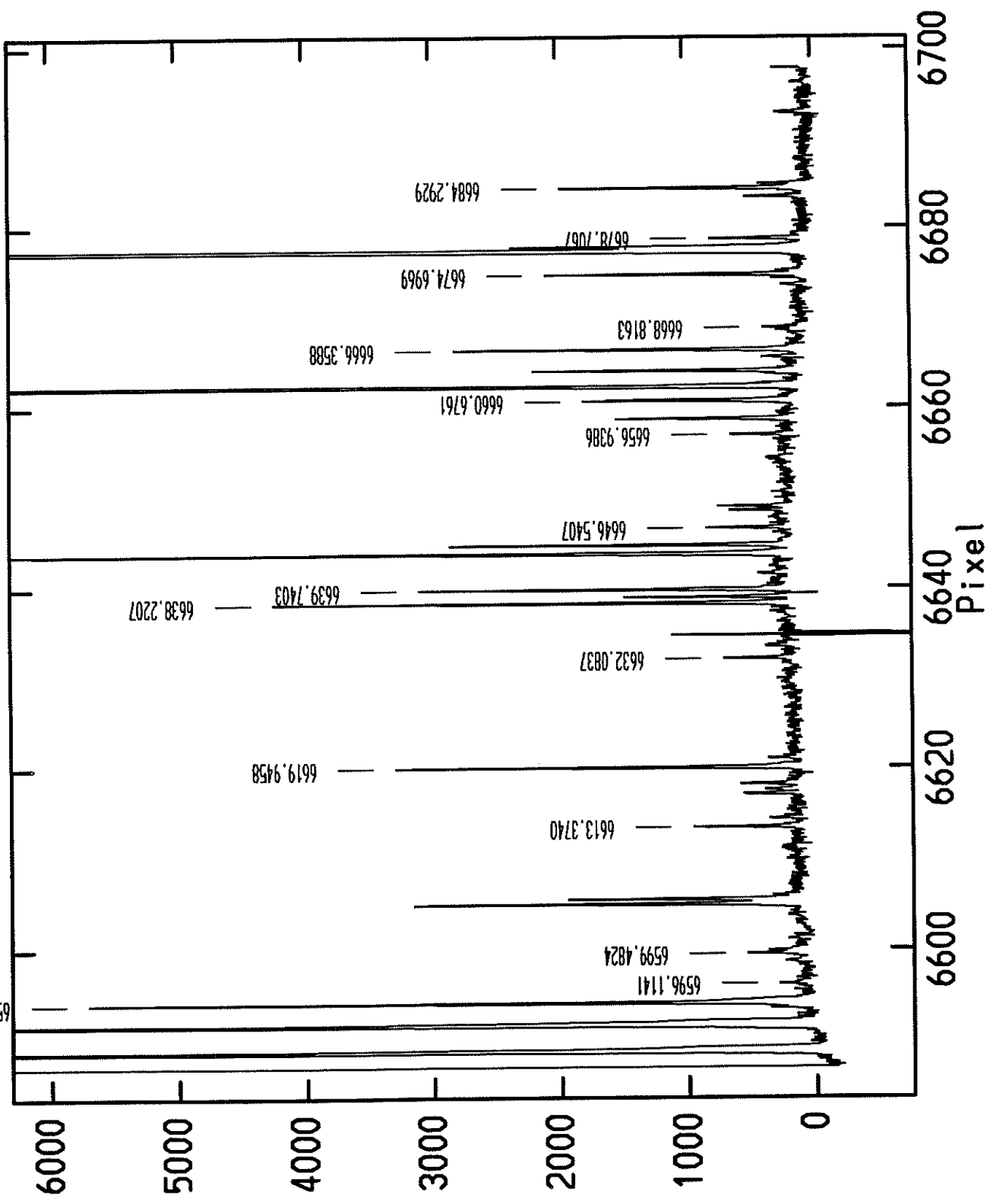
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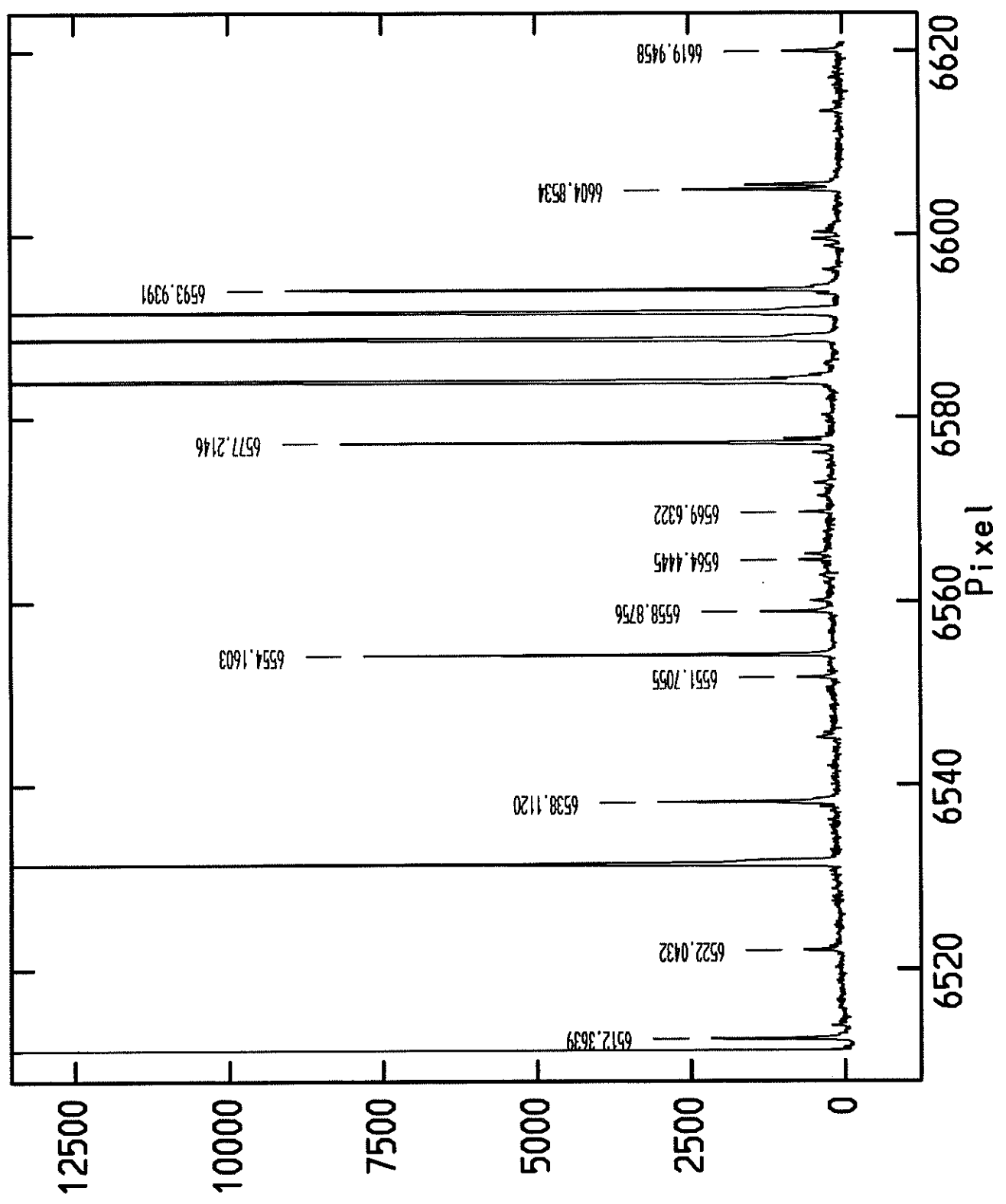
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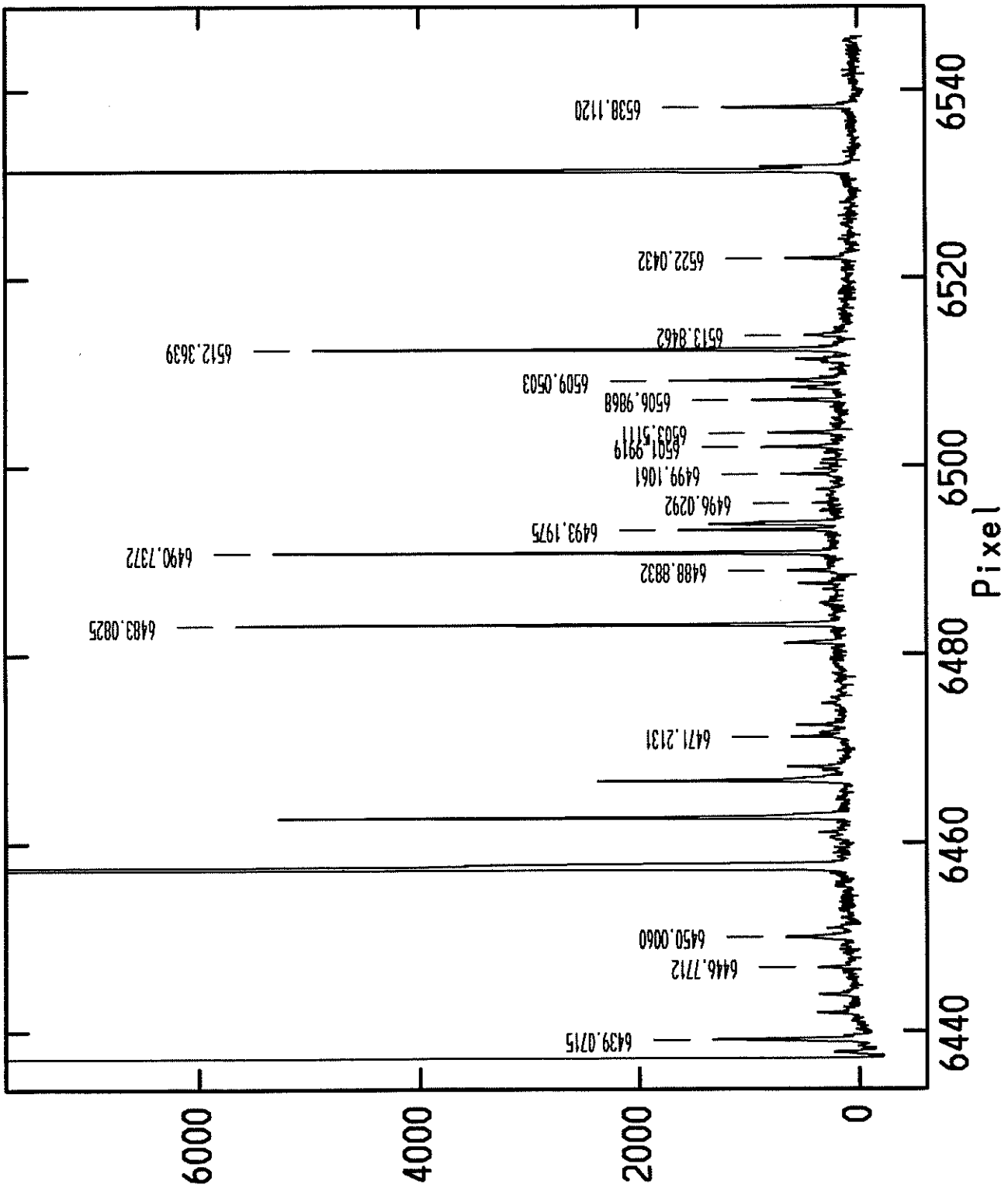


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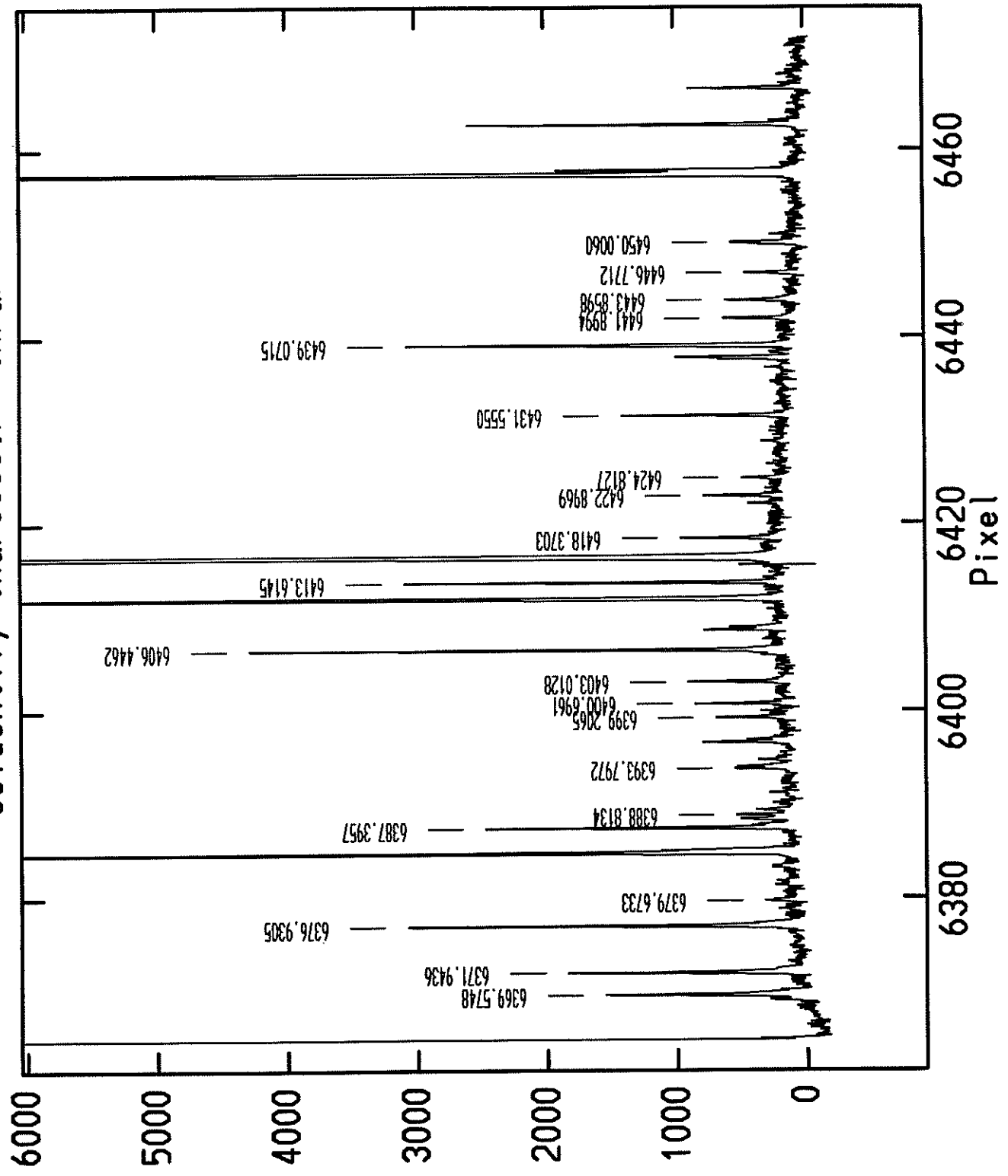


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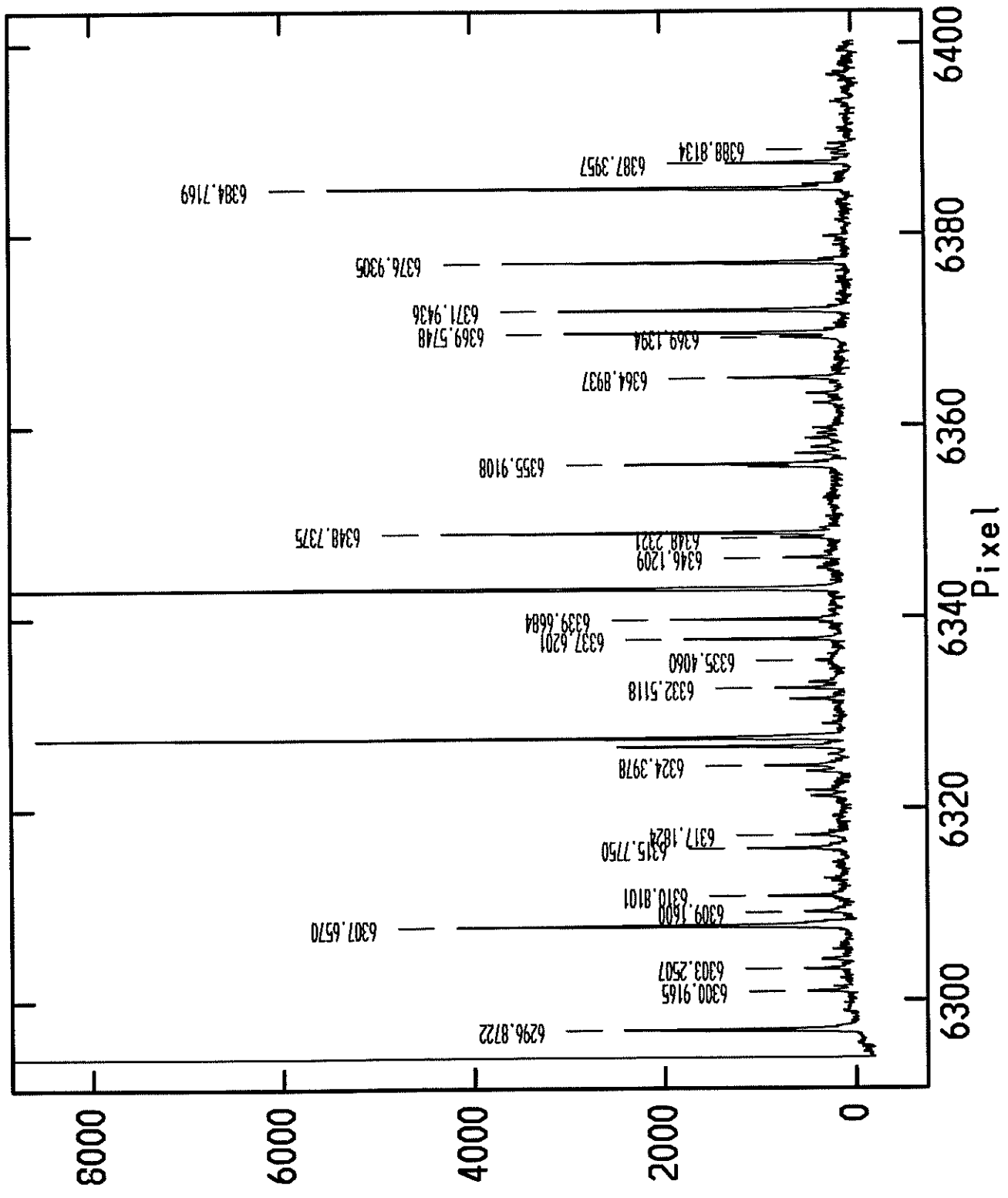




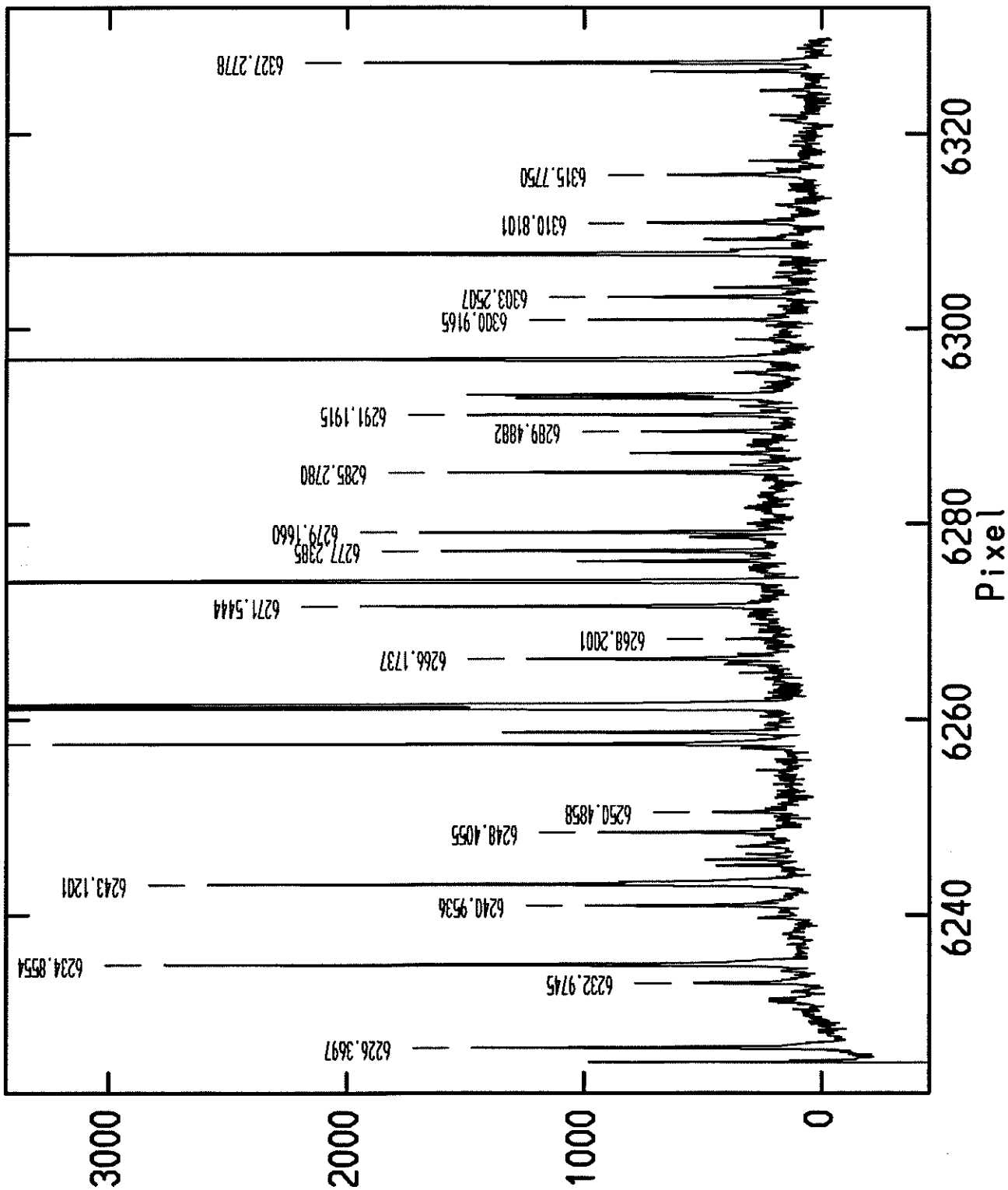
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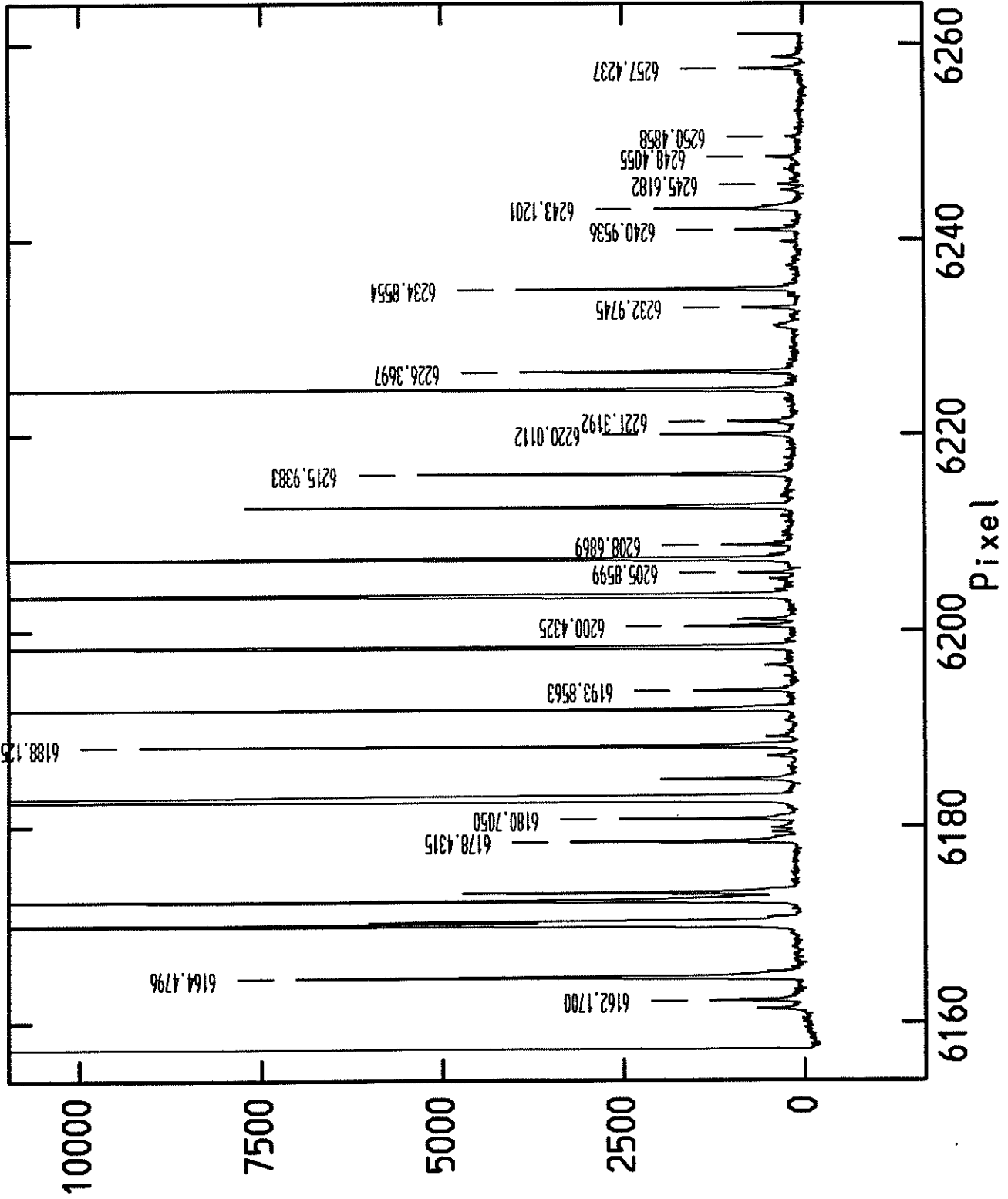
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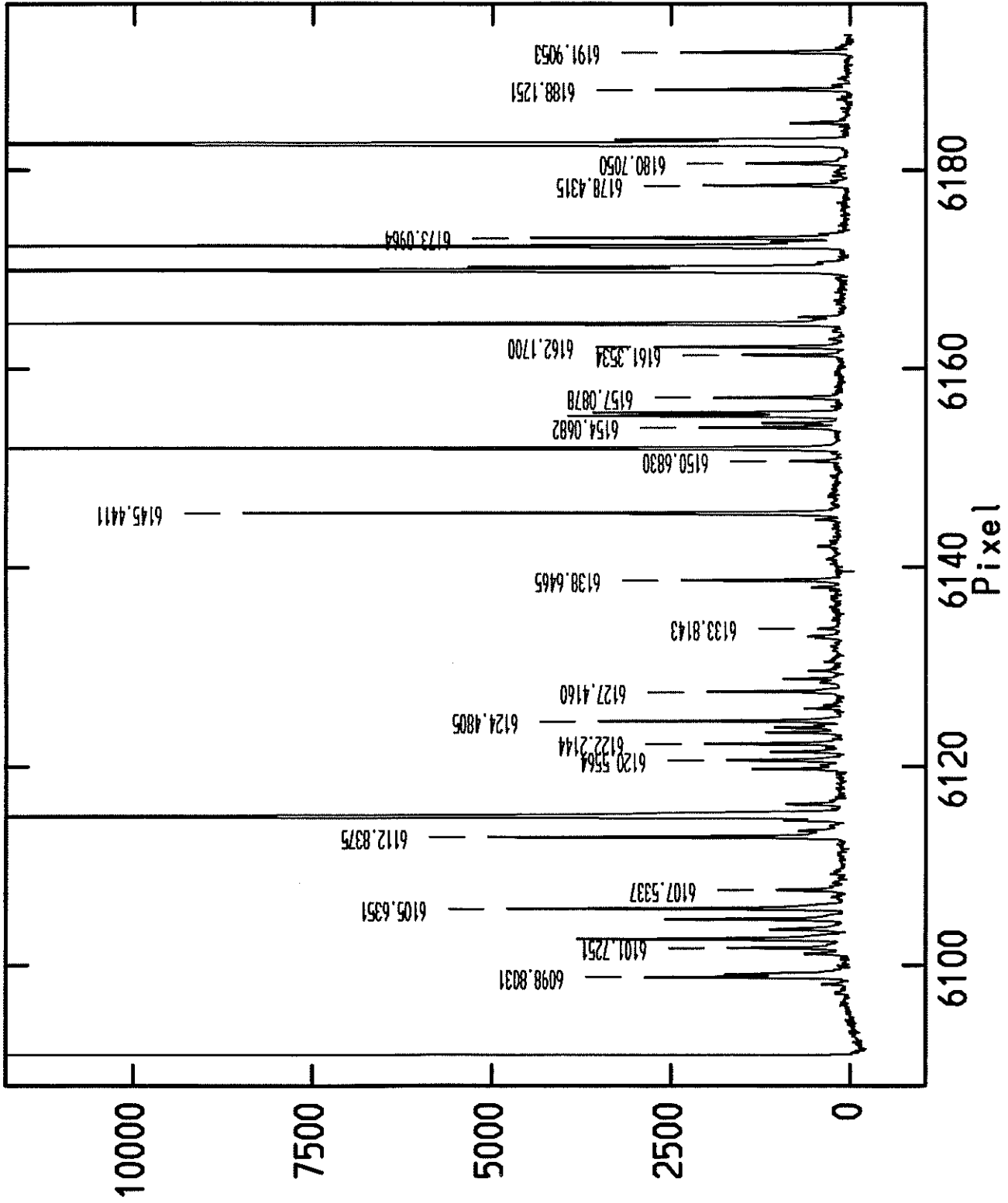
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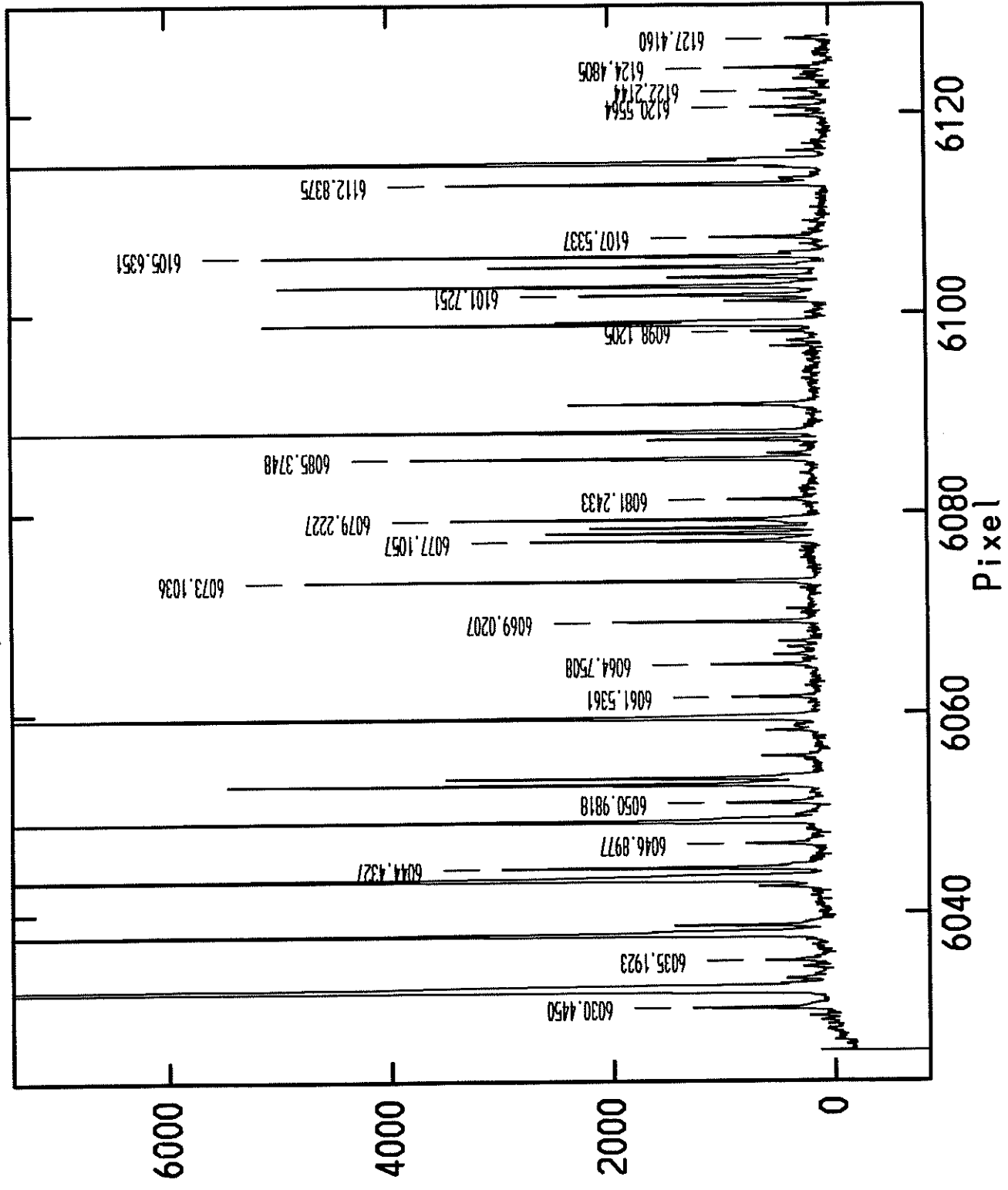
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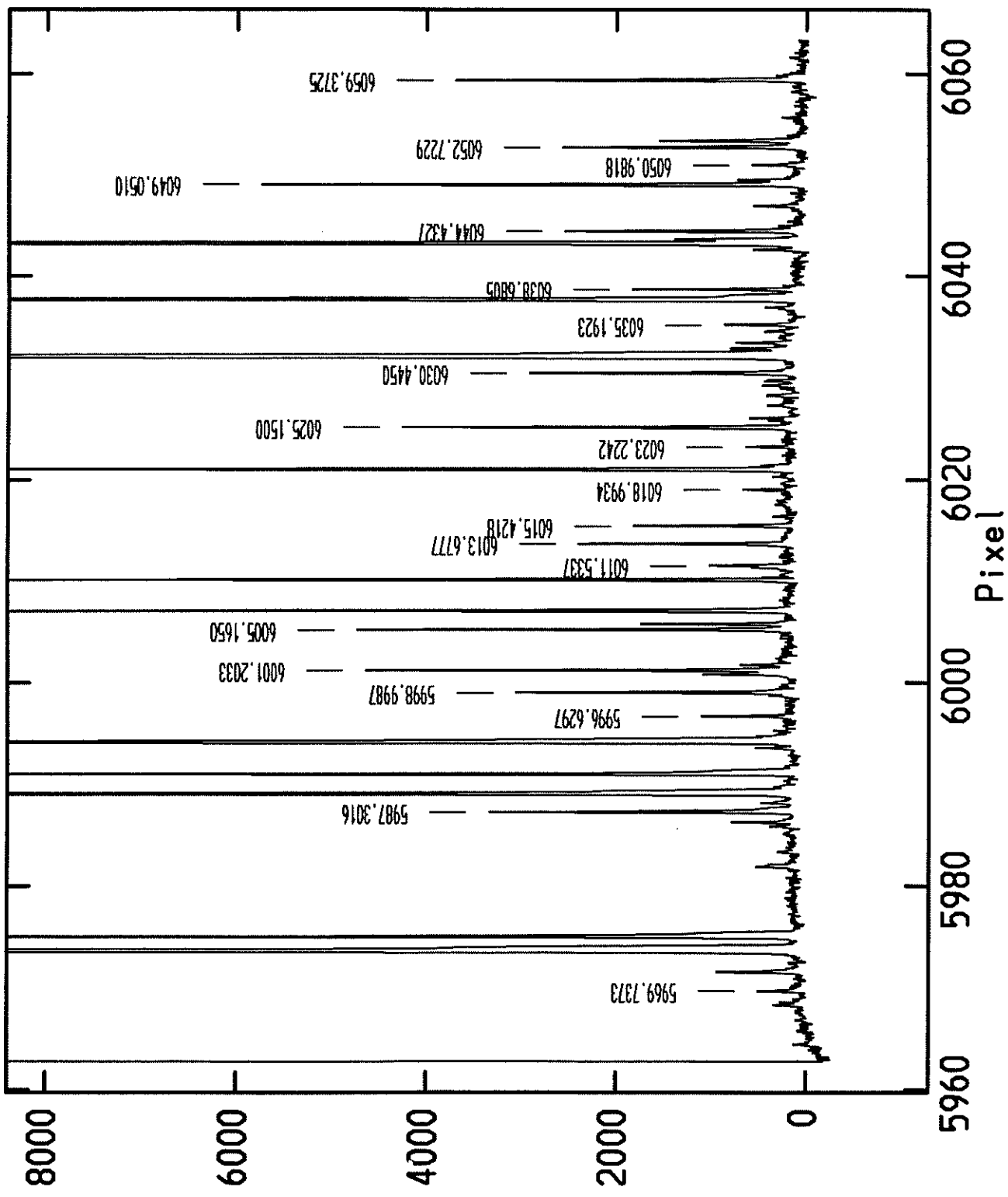
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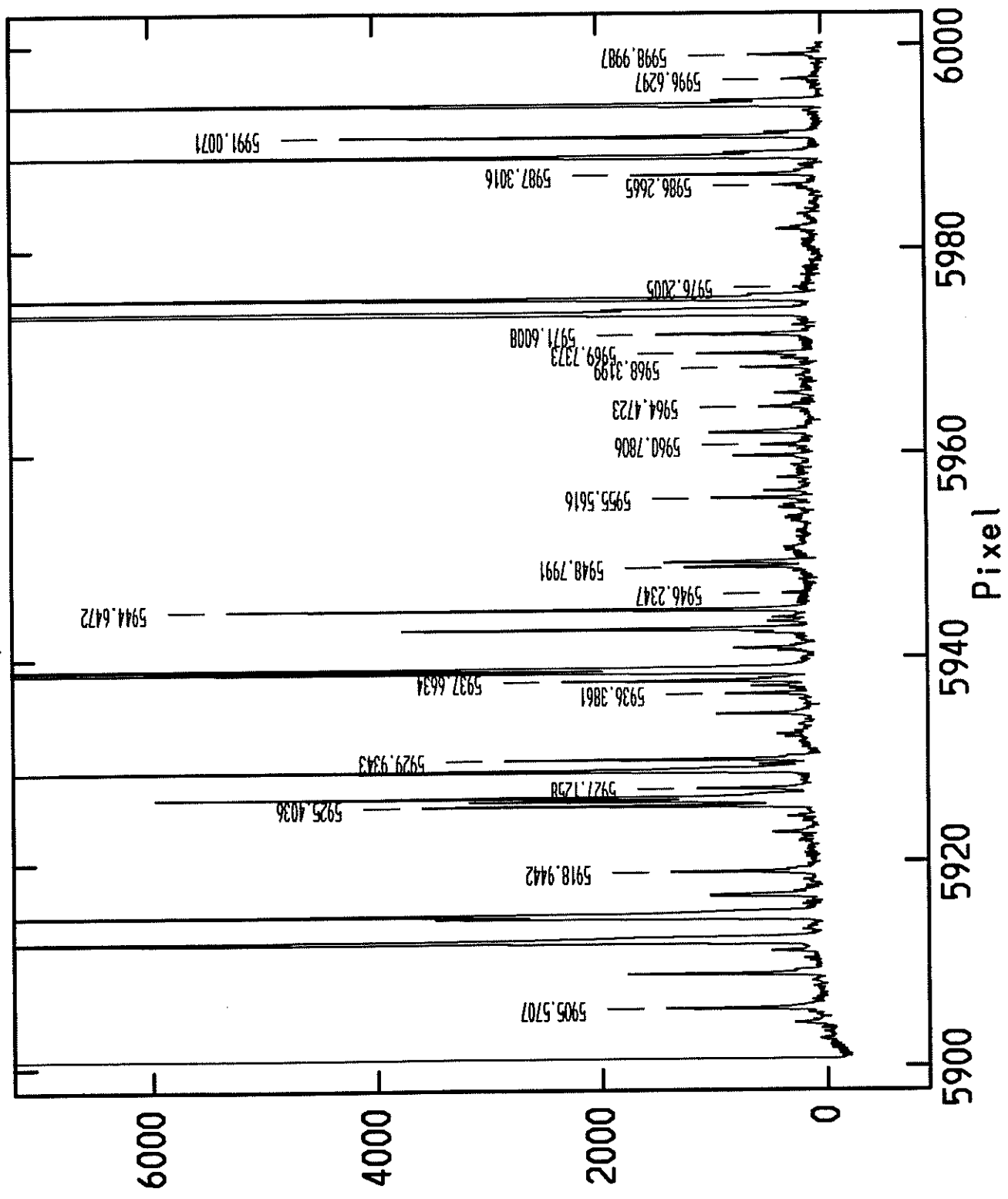
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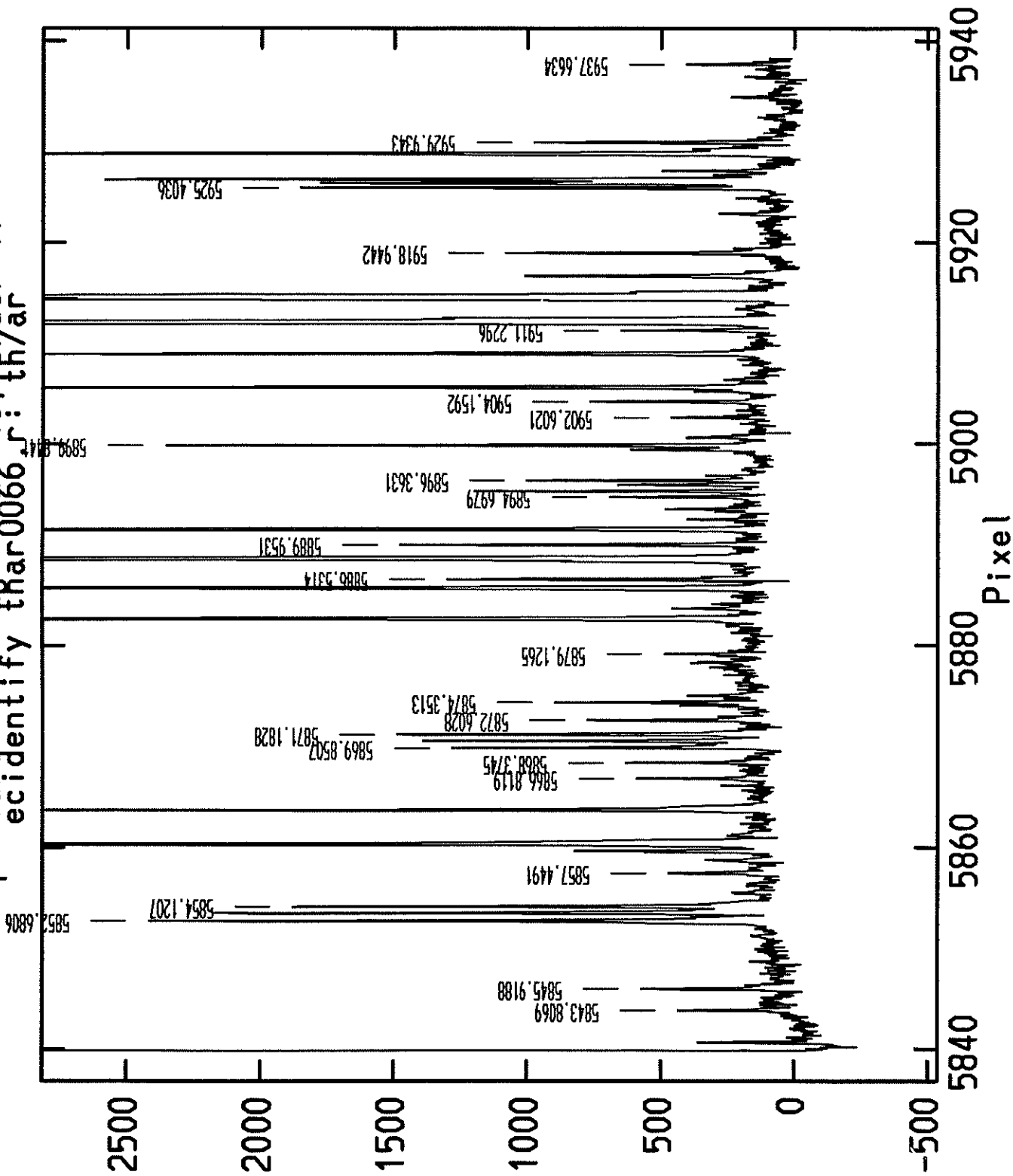
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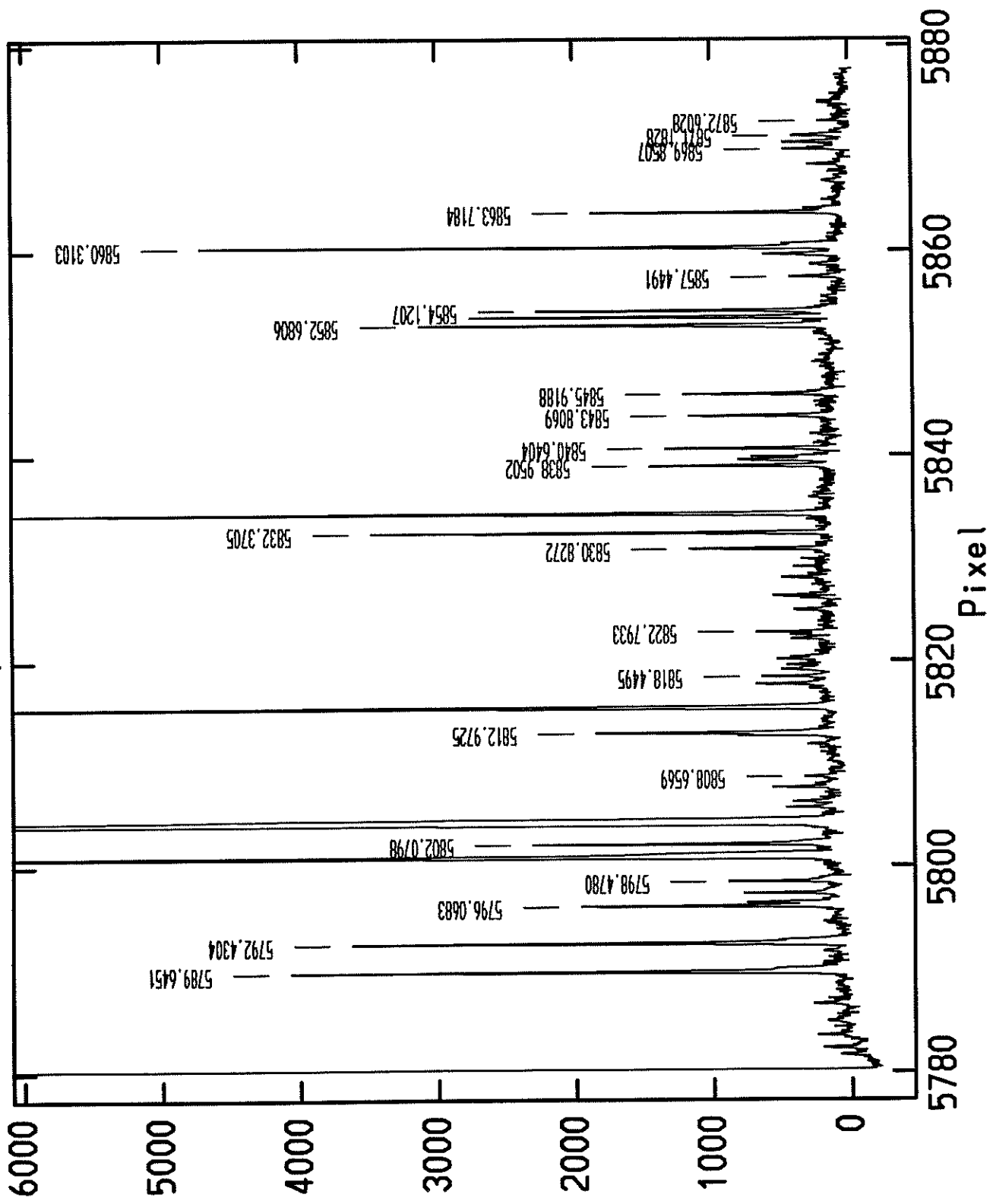
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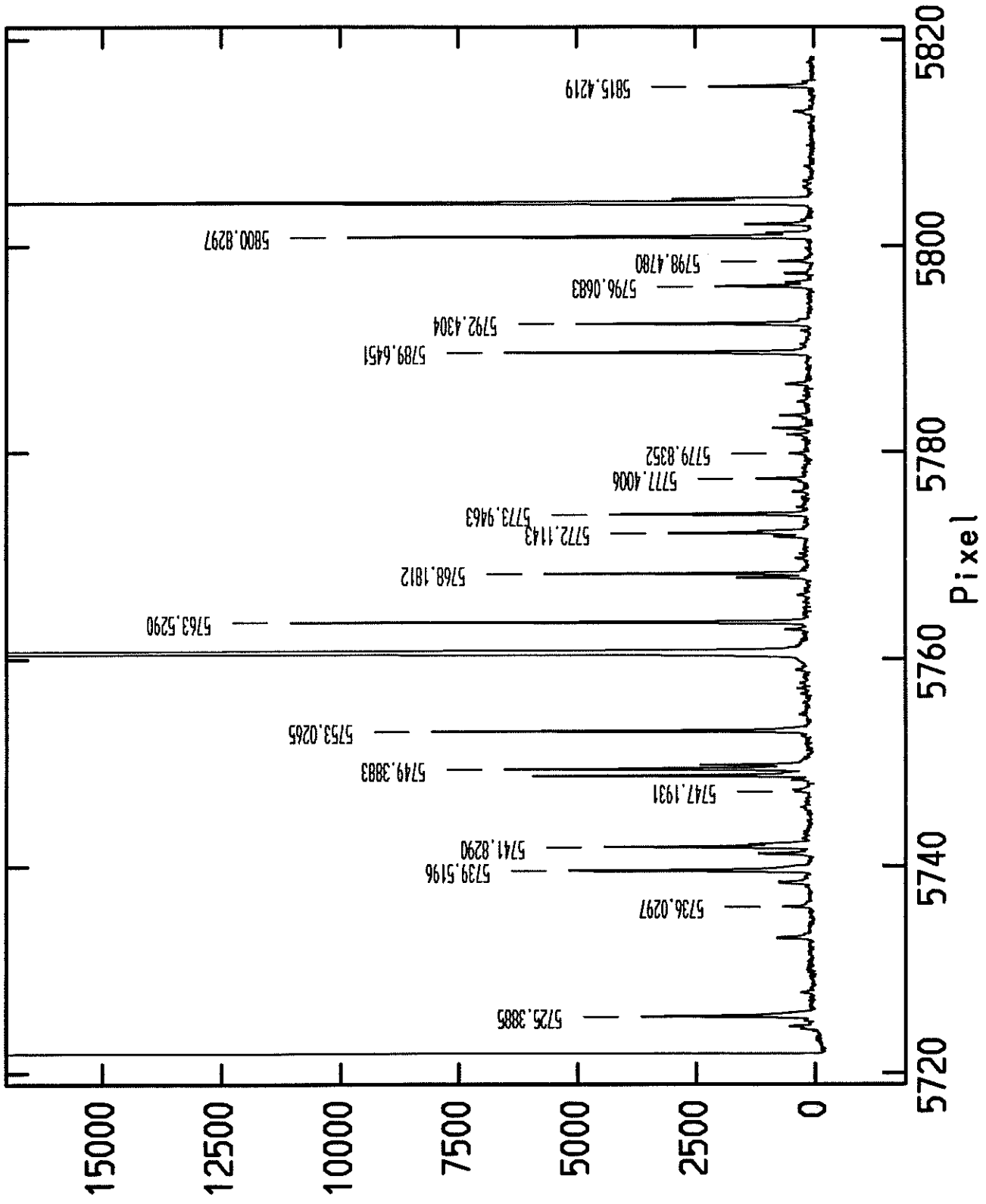


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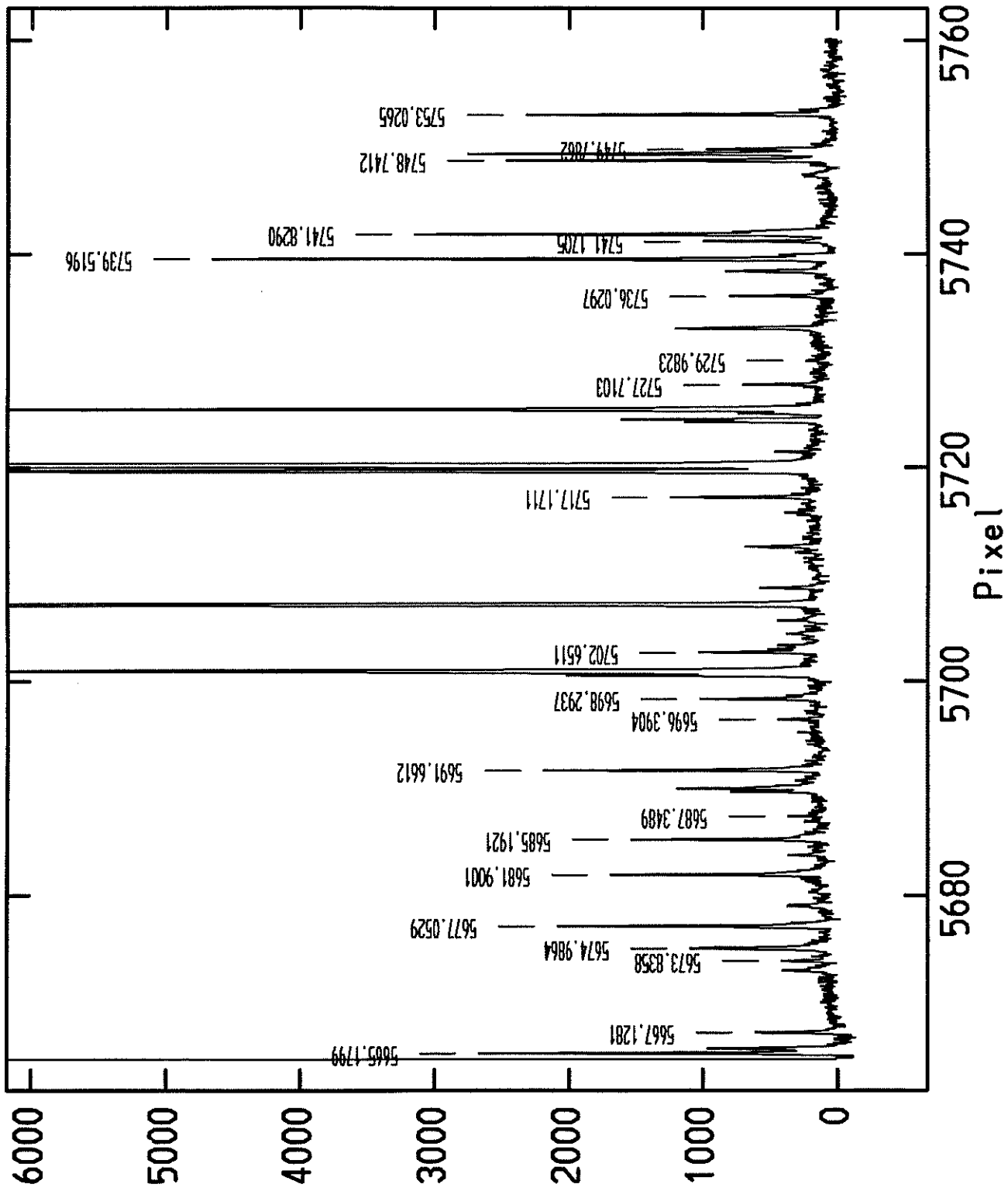


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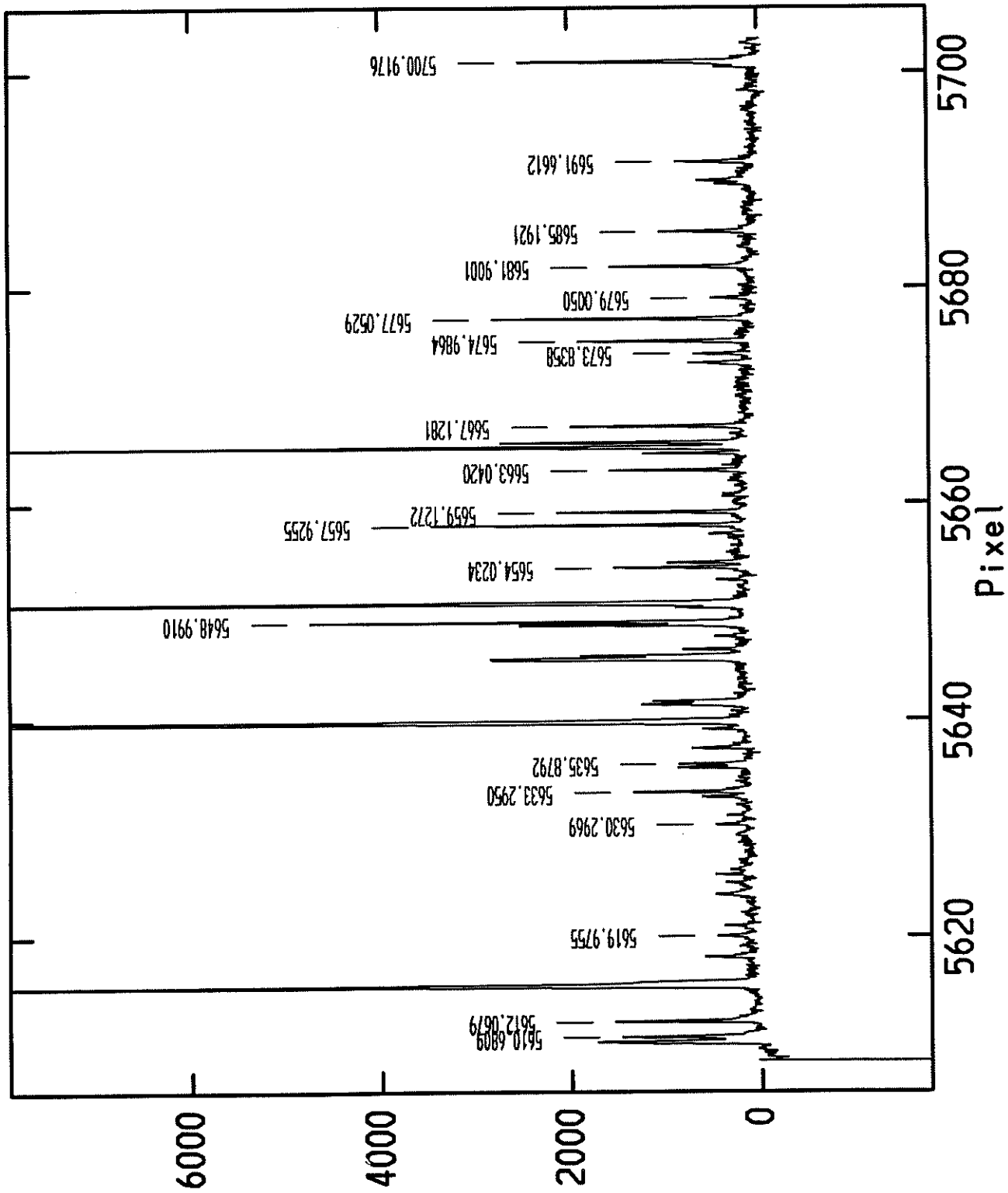




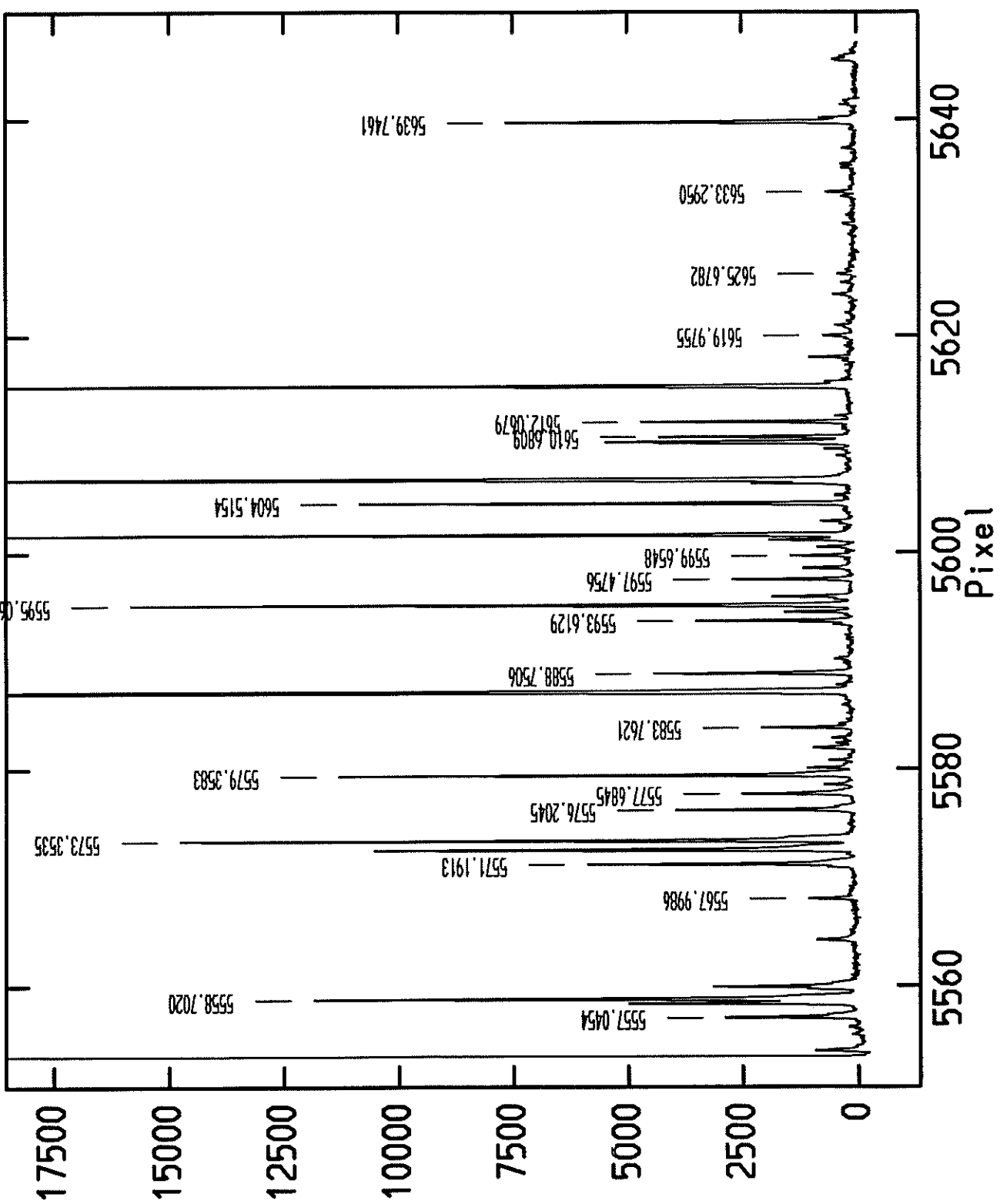
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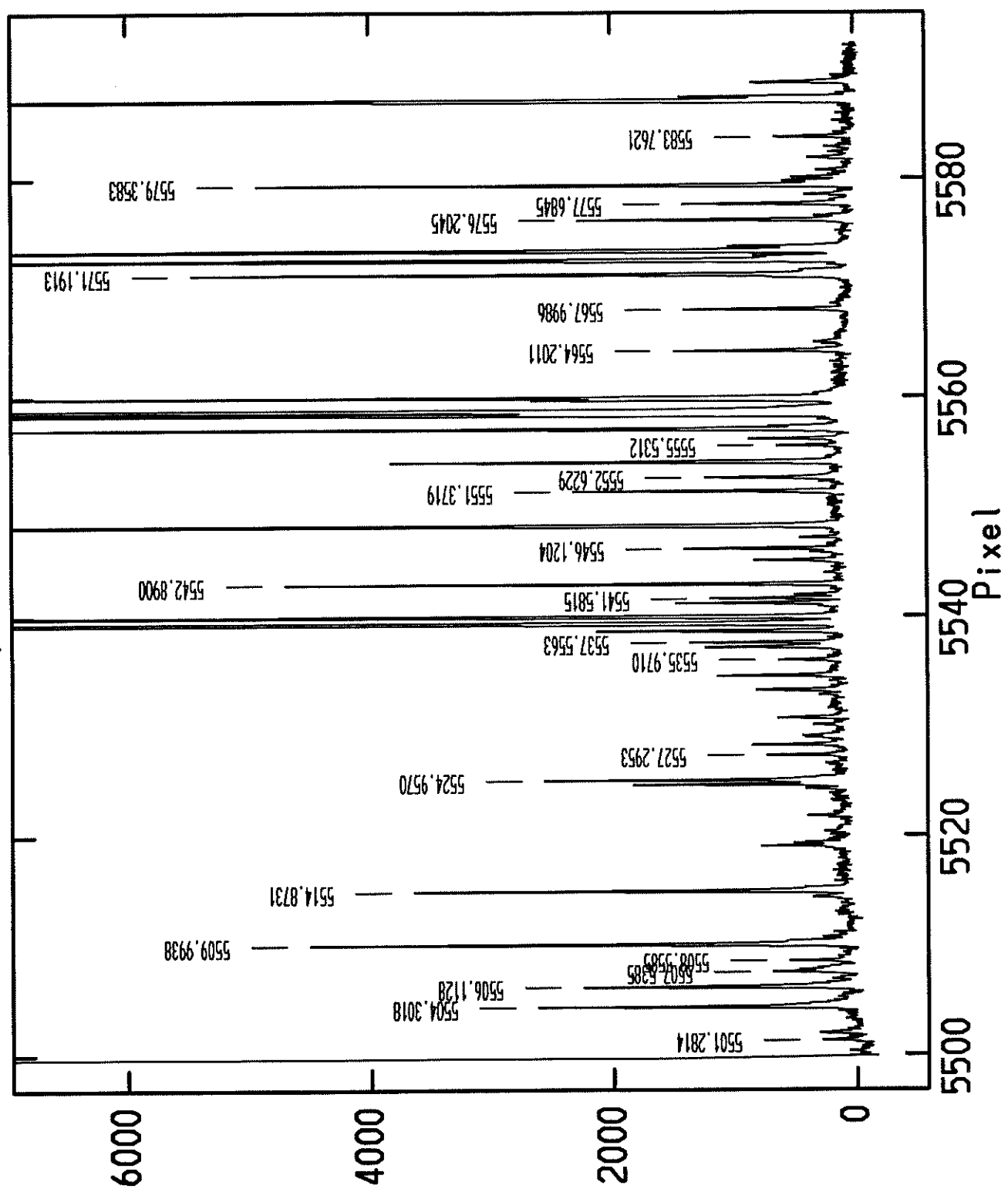
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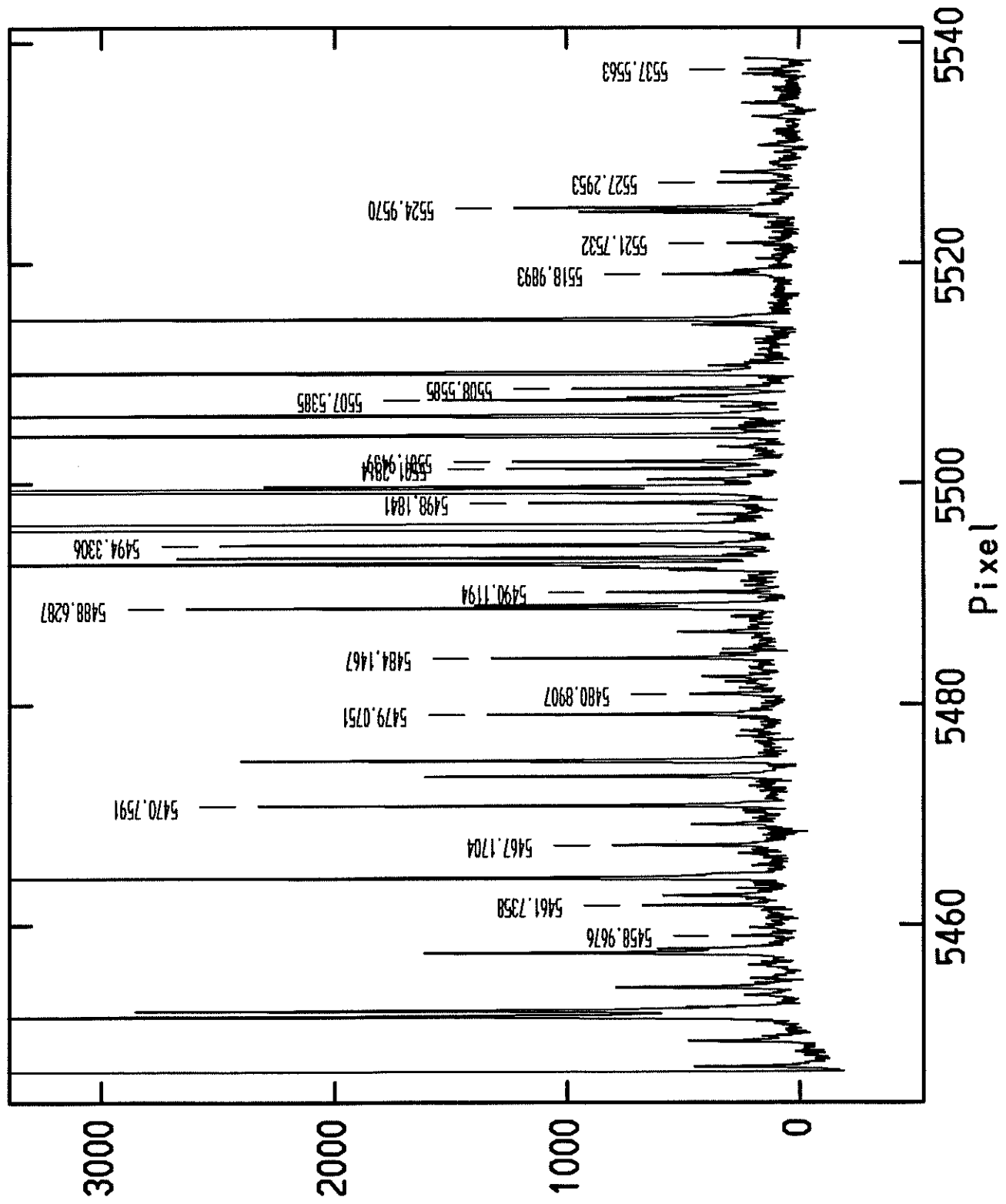


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Identify Char 0066.r: th/ar

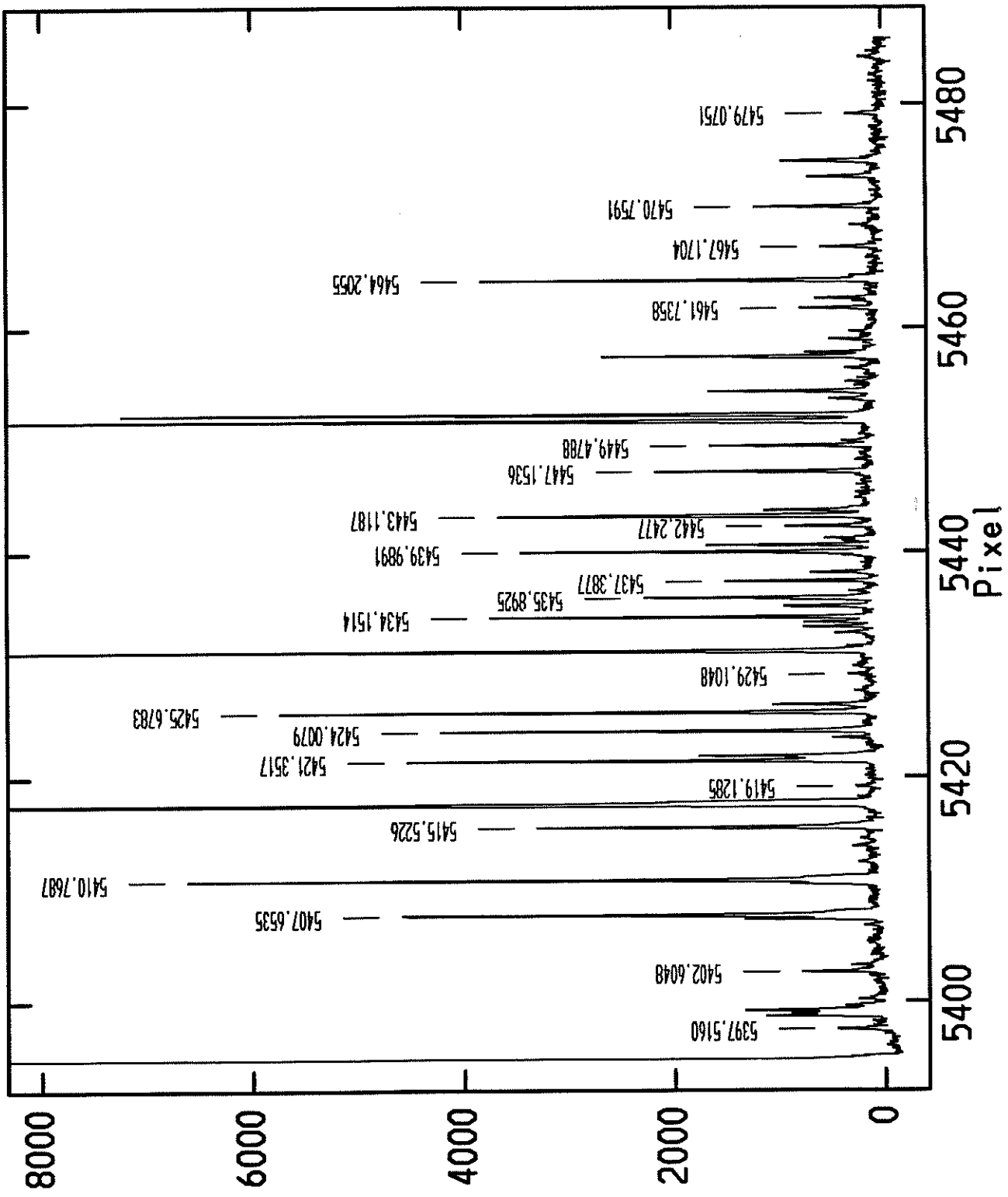


NOAO/IRAF V2.10EXPORT #ds@everdi.VCSC.EDU Mon 12:16:42 09-May-94
Aperture 49. Image Line 49. Order 103
Identify thar0066.r: th/ar

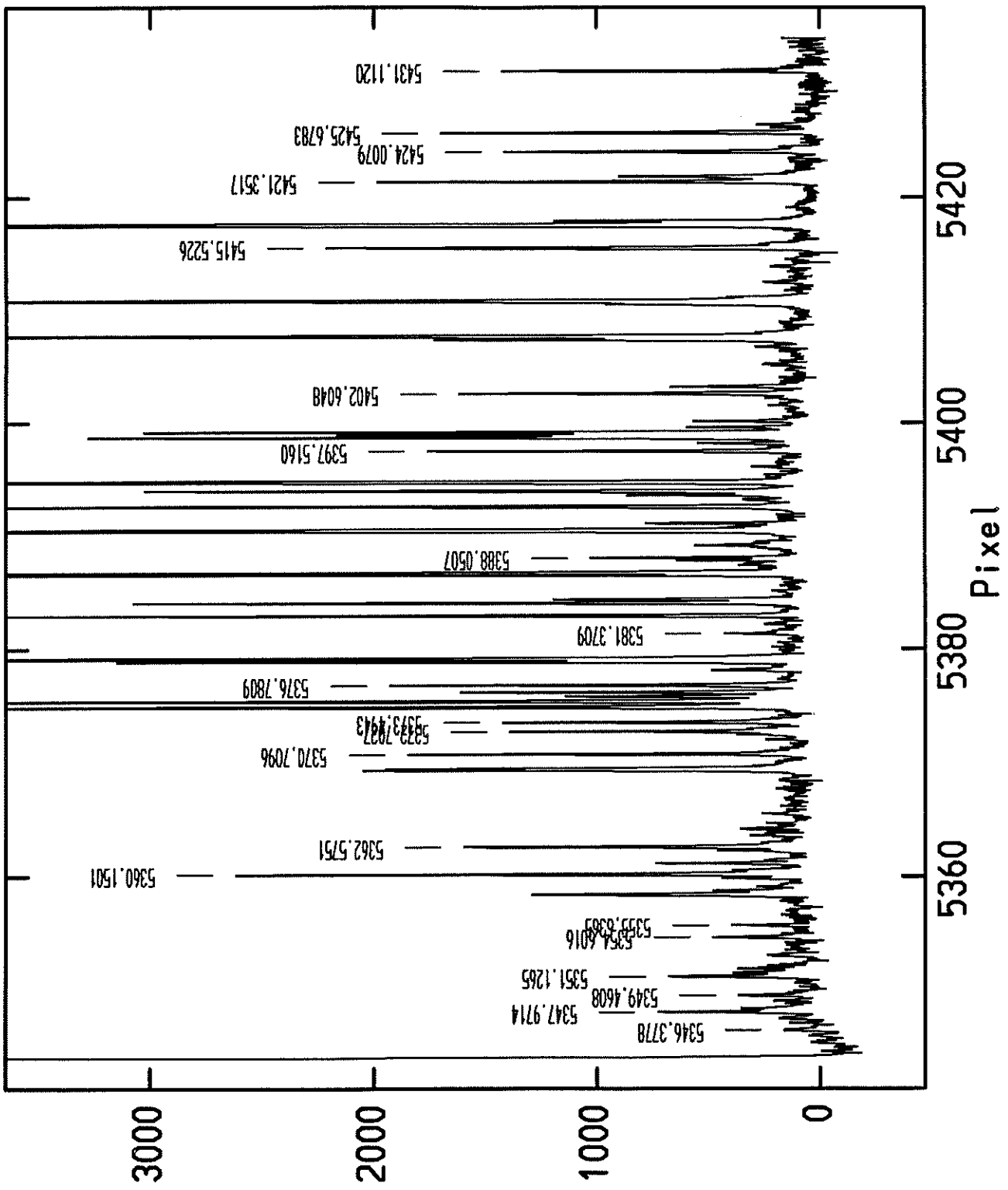




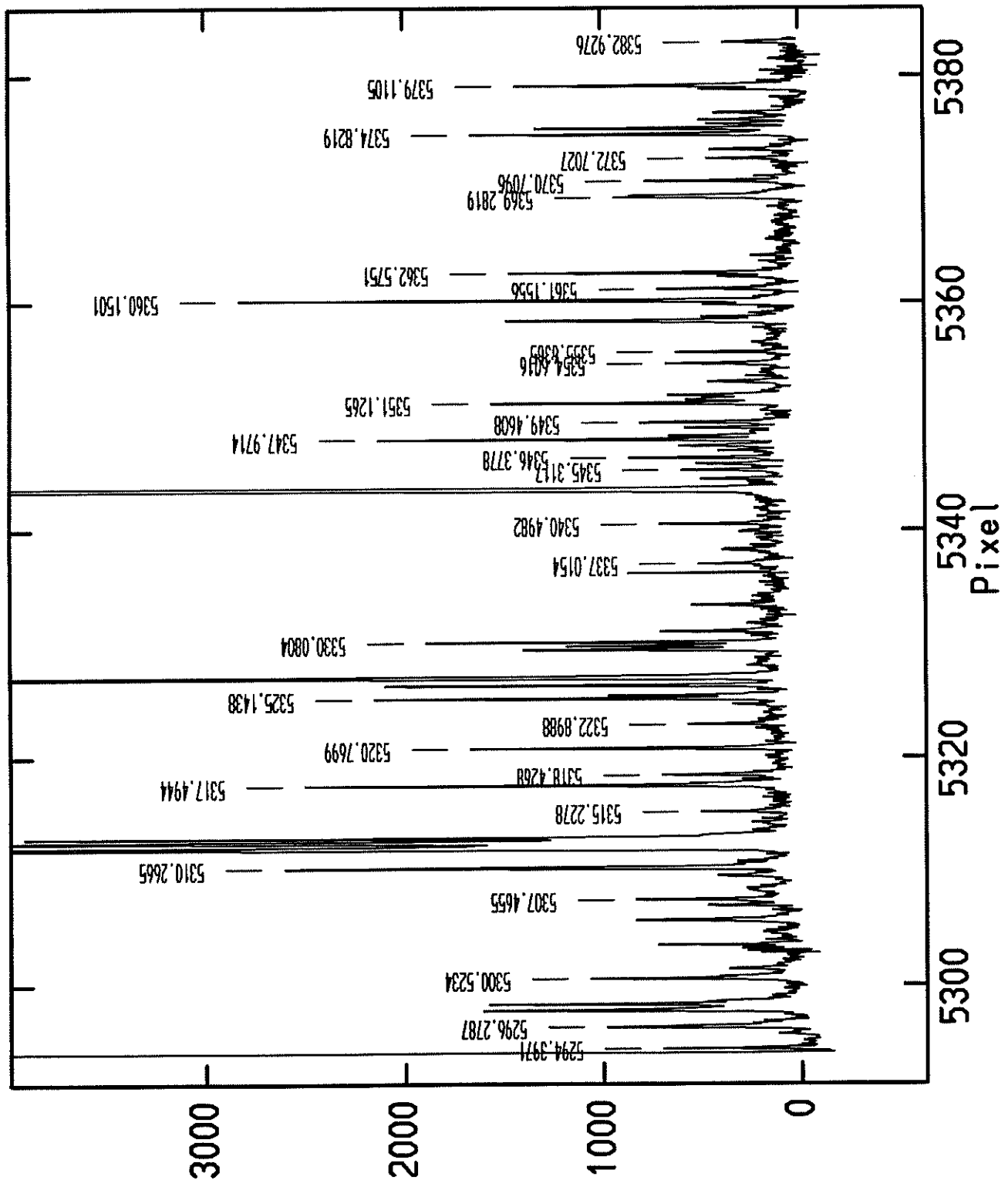
NOAO/IRAF V2.10EXPORT wdseverdi.UCSC.EDU Mon 12:21:42 09-May-94
Aperture 51 Image Line 51 Order 105
identify thar0066.r: th/ar



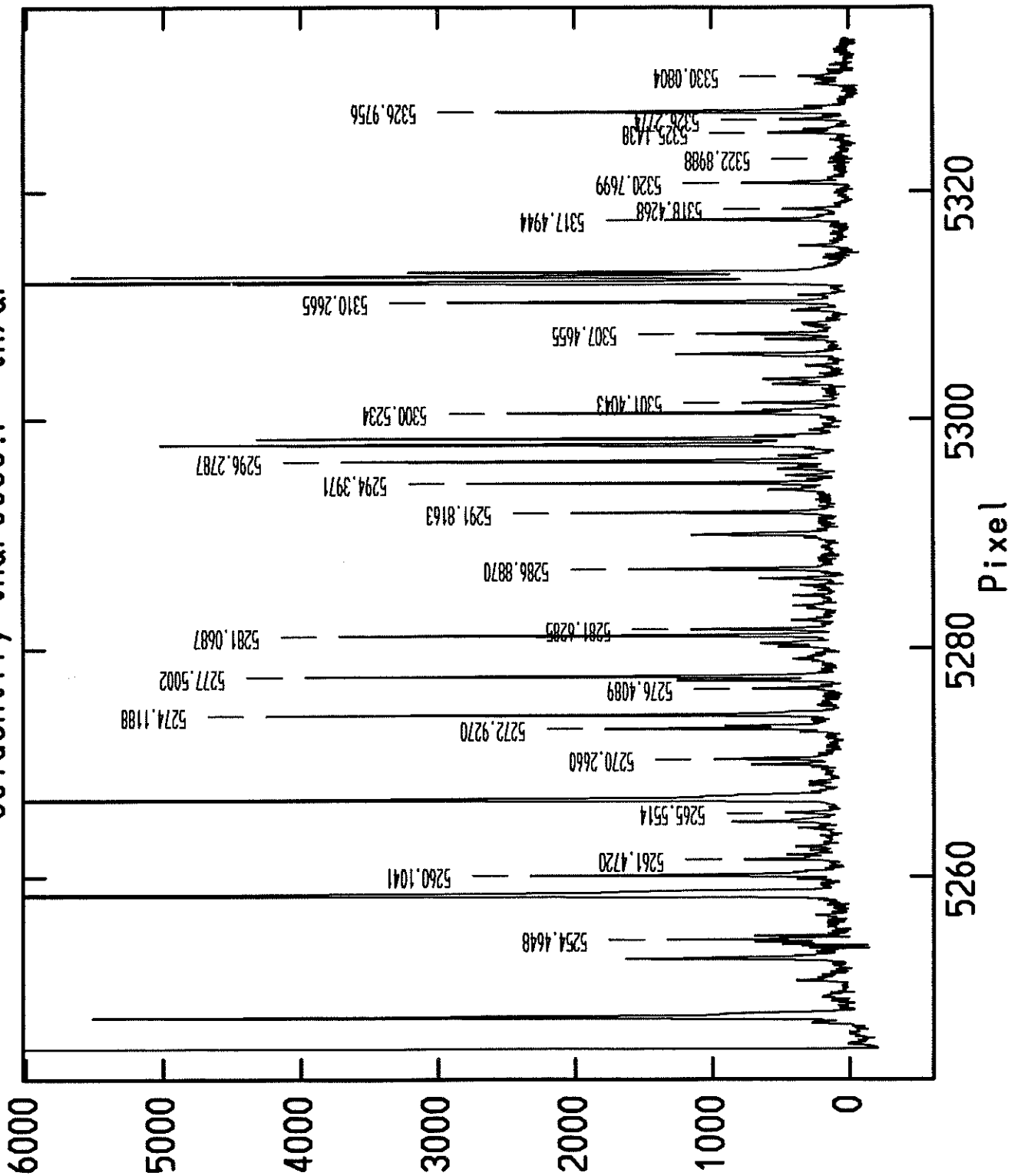
NOAO/IRAF V2.10EXPORT pds@verdi.ucsc.edu Mon 12:23:53 09-May-94
Aperture 52 Image 52 Order 106
identify char 0066.r: th/ar

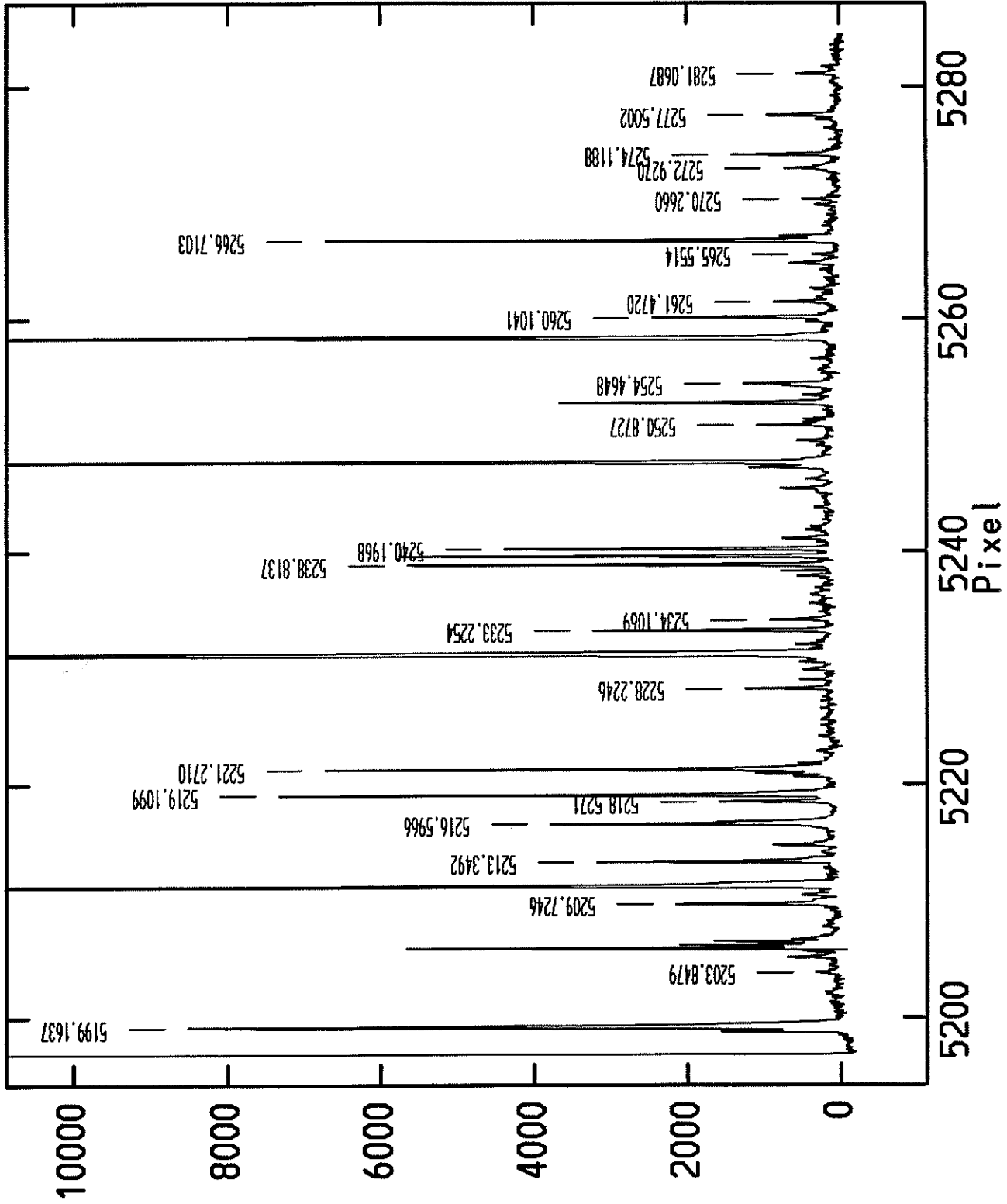


NOAO/IRAF V2.10EXPORT pds@verdi.ucsc.edu Mon 12:25:45 09-May-94
Aperture 53 Image Line 53 Order 167
Identify thar0066.r: th/ar

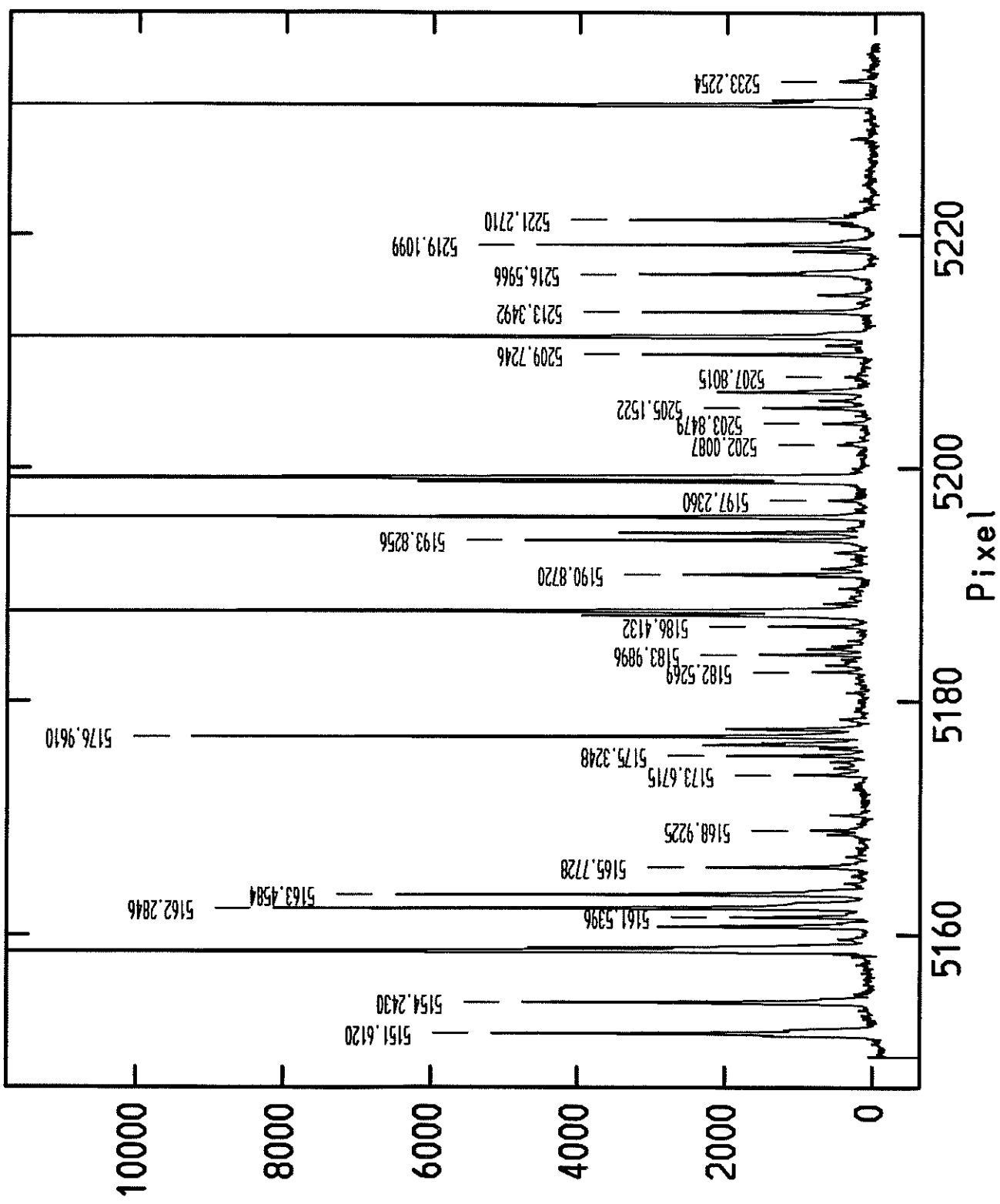


NGAO/IRAF V2.10EXPORT pds@verdi.ucsc.edu Mon 12:29:00 09-May-94
Aperture 54 Image Line 54 Order 108
identify thar0066.r: th/ar

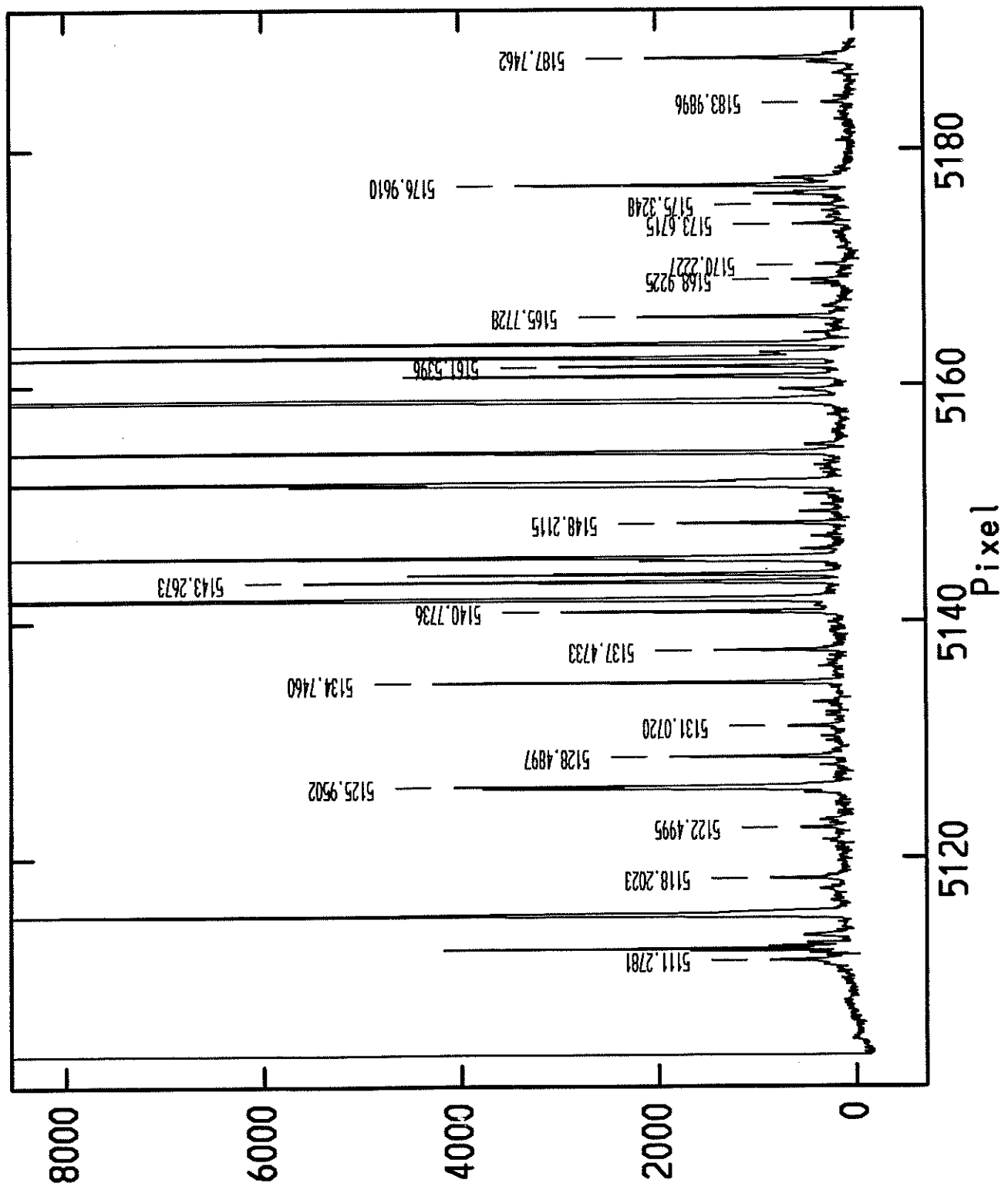




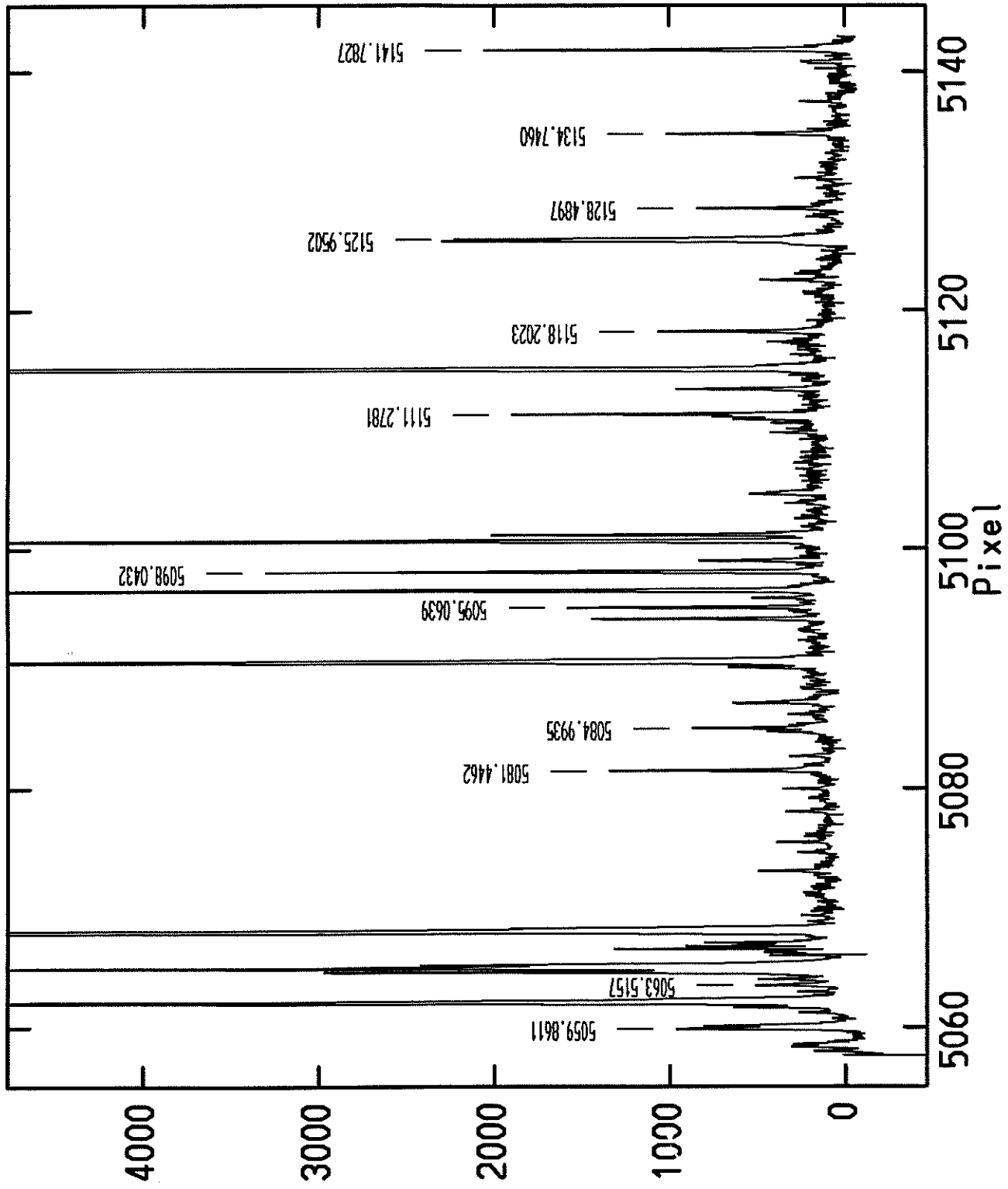
NOAO/IRAF V2.10EXPORT mdseverdi@ucsc.edu Mon 12:32:21 09-May-94
Aperture 50, Image file 56, Order 116
identify thar0066.r: th/ar



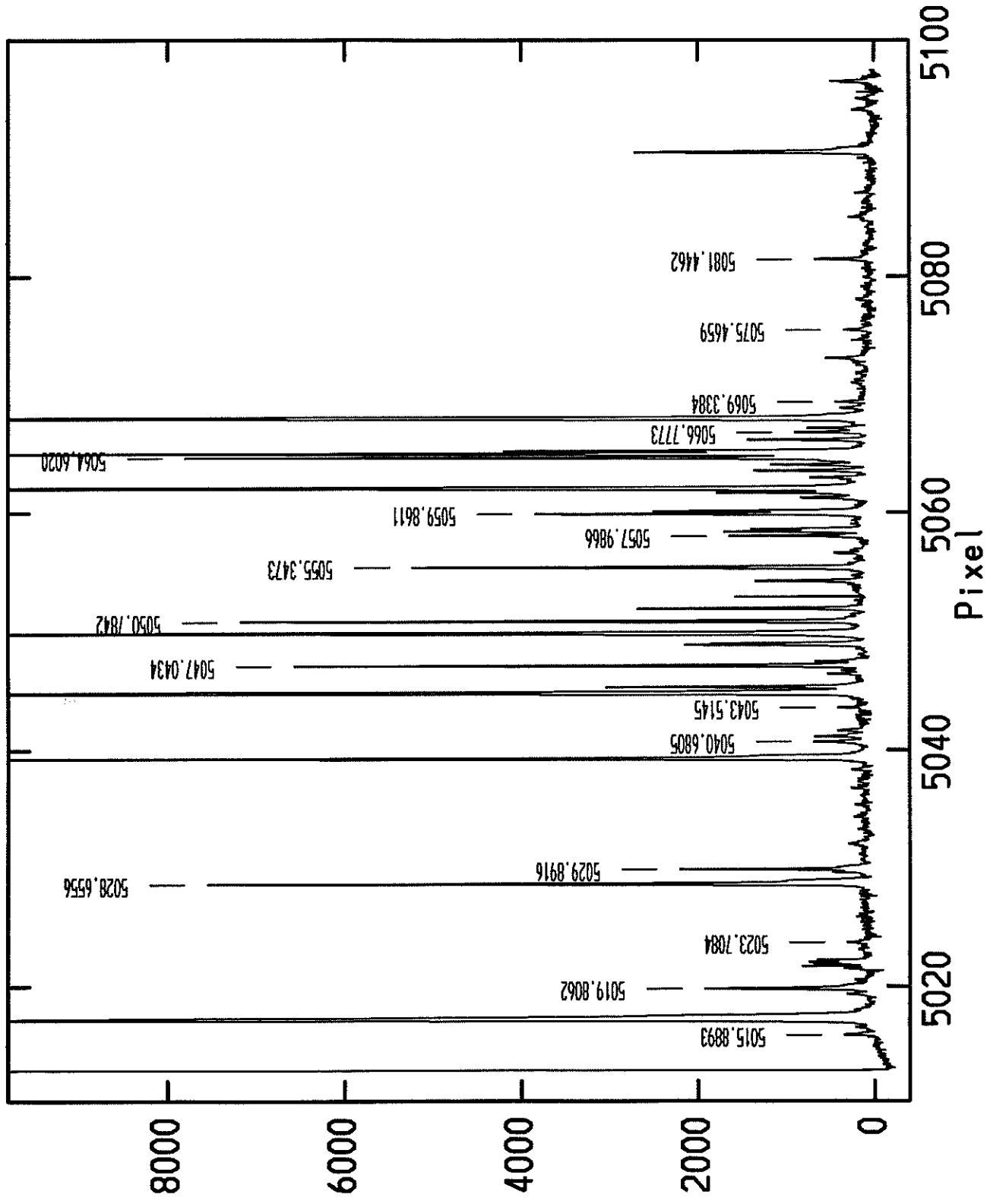
NOAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Mon 12:33:40 09-May-94
Aperture 5/ Image Line 57 Order 111
identify thar0066.r: th/ar



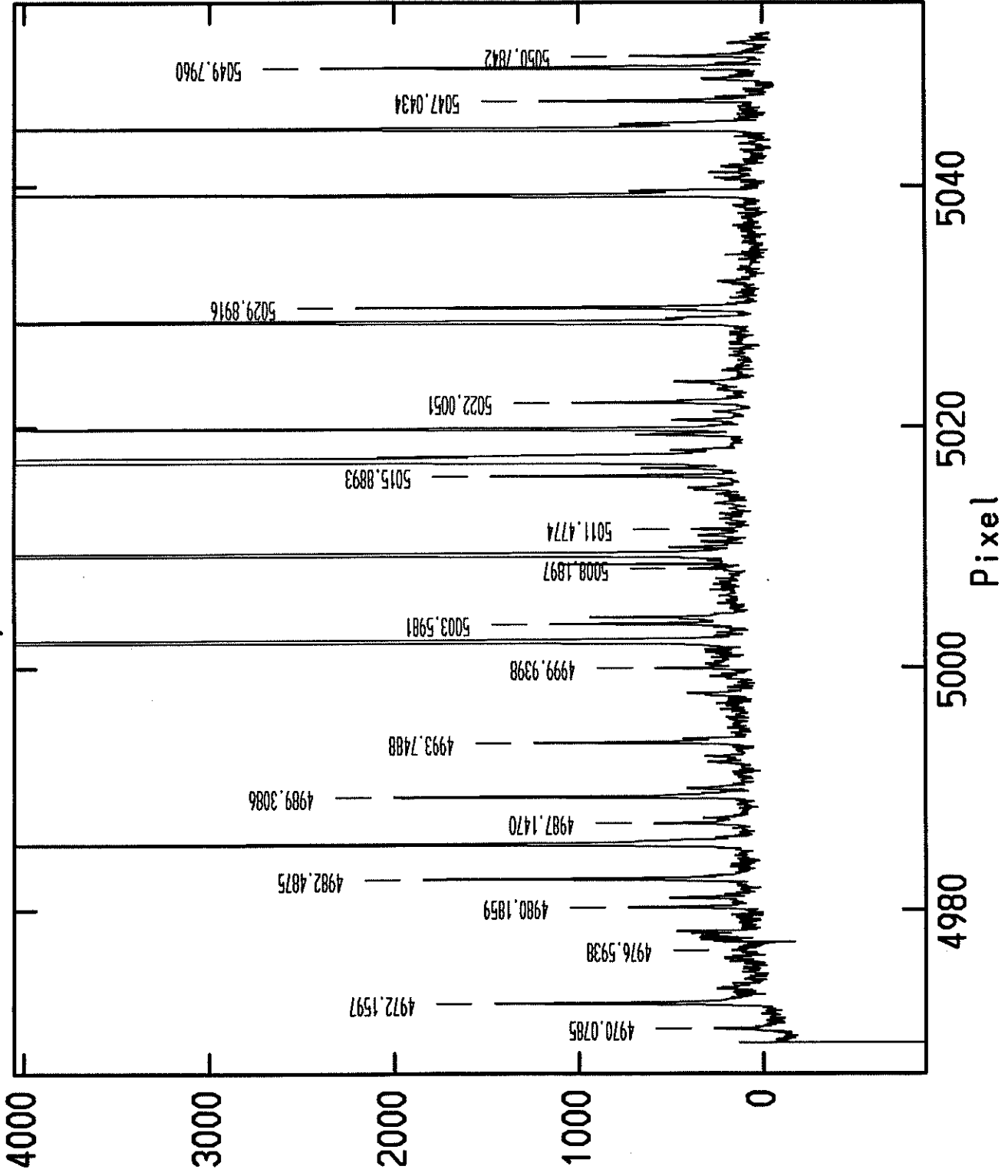
NDAO/IRAF V2.10EXPORT mdseverdi@ucsc.edu Mon 12:34:52 09-May-94
Aperture 58 Image Line 58 Order 112
identify char 0066.r: th/ar



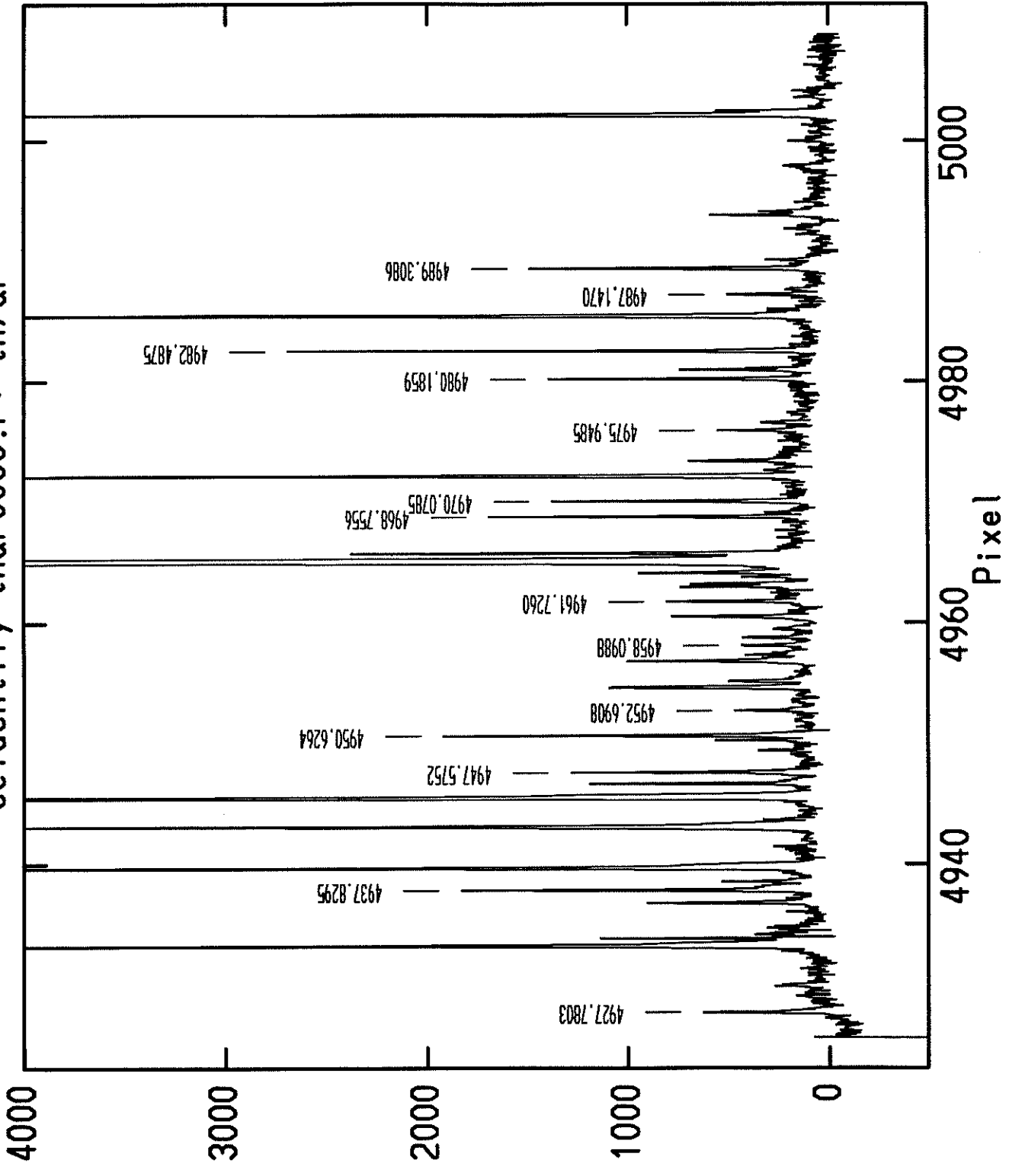
NOAO/IRAF V2.10EXPORT @ds@verdi.ucsc.edu Mon 12:36:55 09-May-94
Aperture 59 Image Line 59 Order 113
identify thar0066.r: th/ar



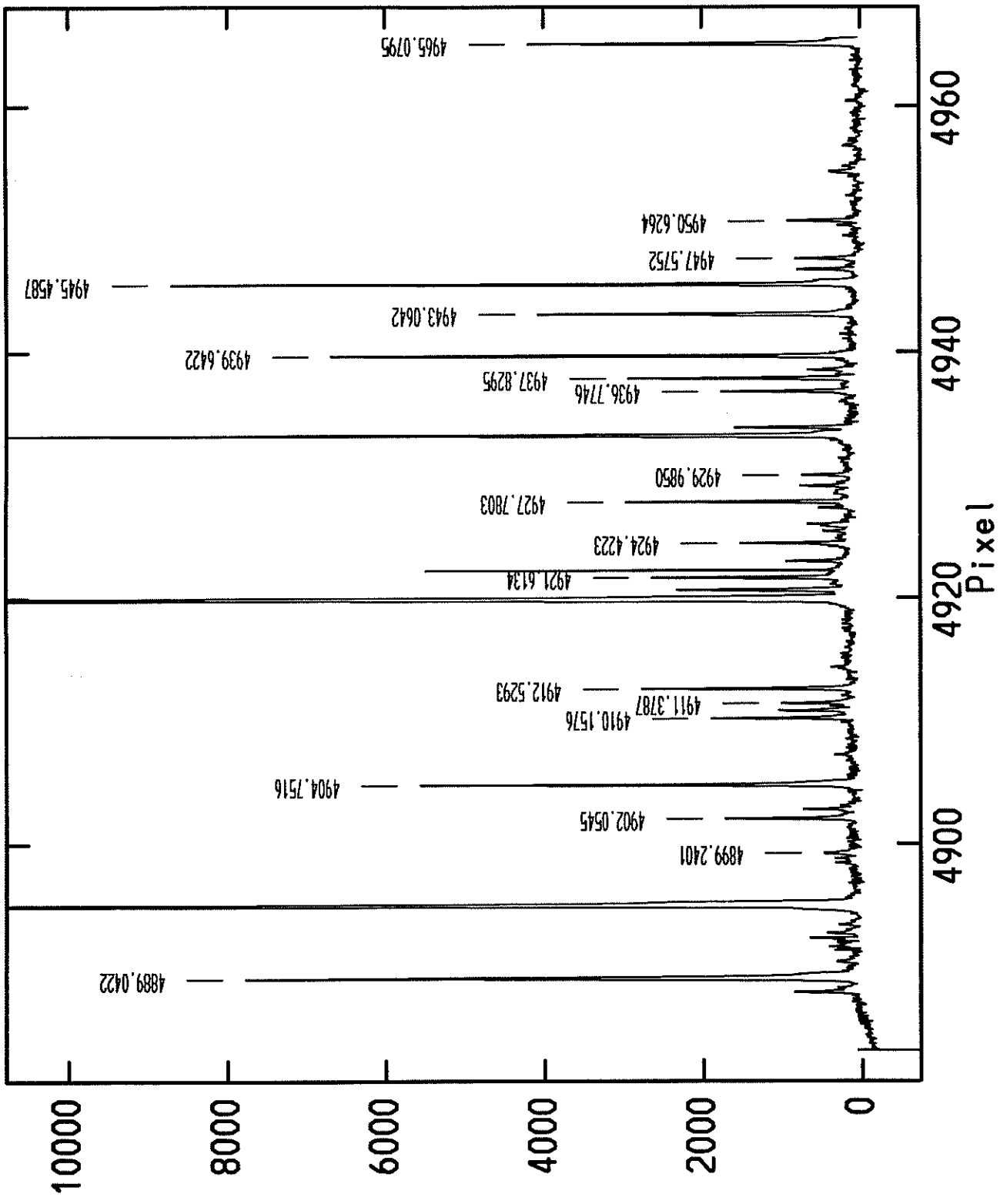
NOAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Thu 16:59:46 12-May-94
Aperture 60 Image Line 60 Order 114
identify thar0066.r: th/ar



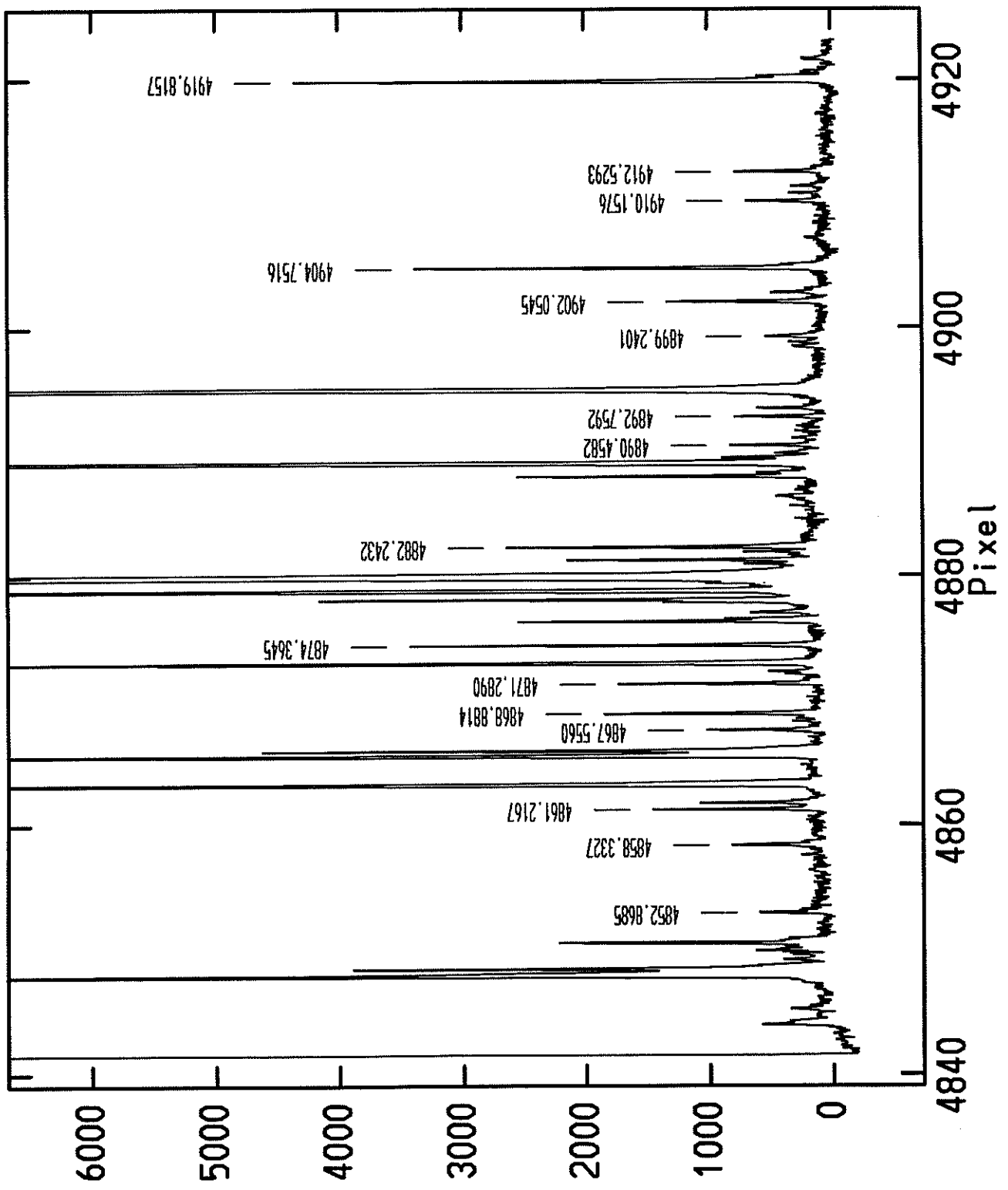
NOAO/IRAF V2.10EXPORT vds@verdi.ucsc.edu Thu 17:01:20 12-May-94
Aperture of Image Line 61, Order 115
Identify that 0066.r: th/ar



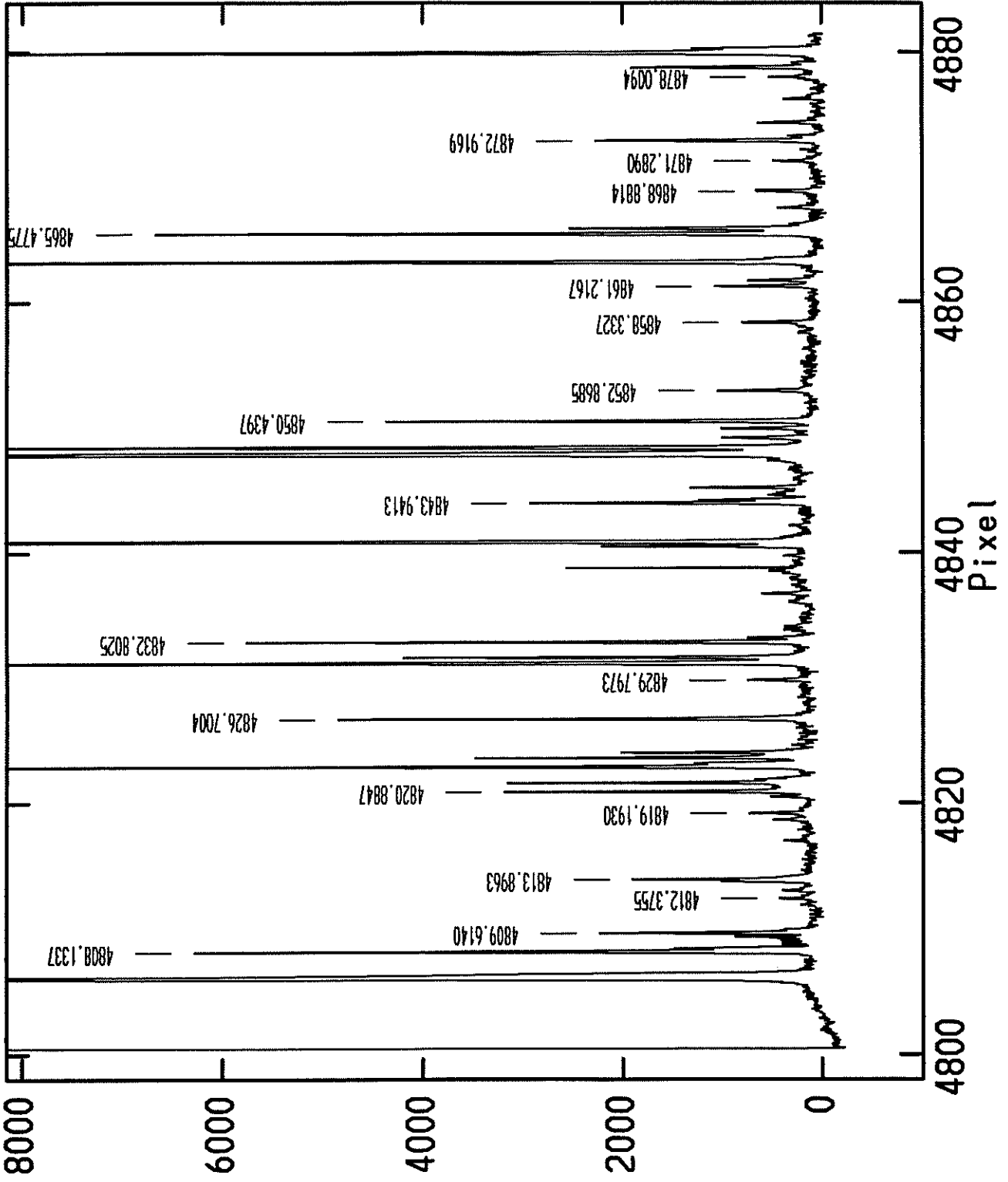
NOAO/IRAF V2.10EXPORT mdseverdi@ucsc.edu Thu 17:04:00 12-May-94
Aperture 62, Image file 62, Order 116
identify thar0066.r: th/ar



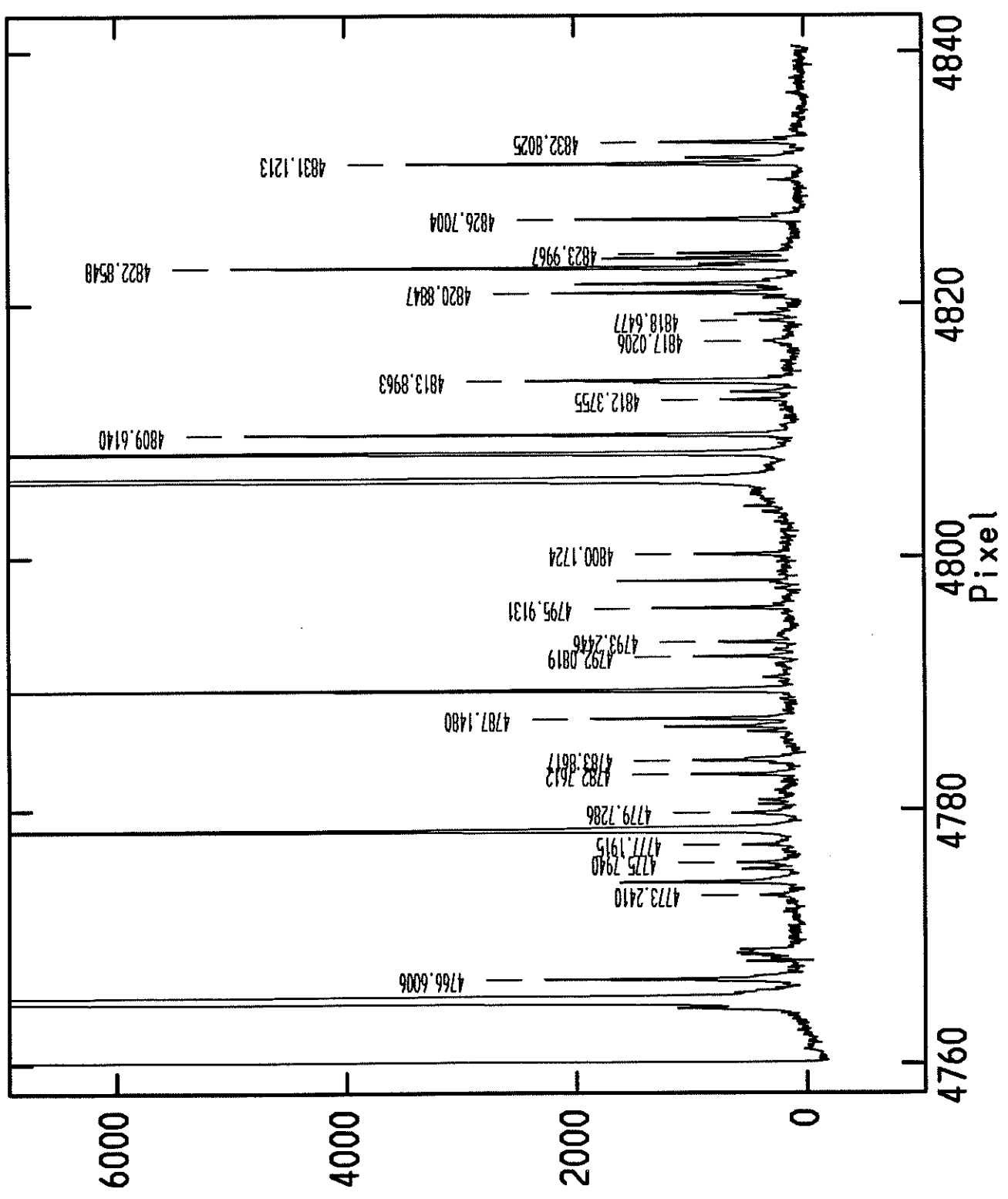
NOAO/IRAF V2.10EXPORT mdseverdi@ucsc.edu Thu 17:06:06 12-May-94
Aperture 63 Image Line 63 Order 119
Identify thar0066.r: th/ar



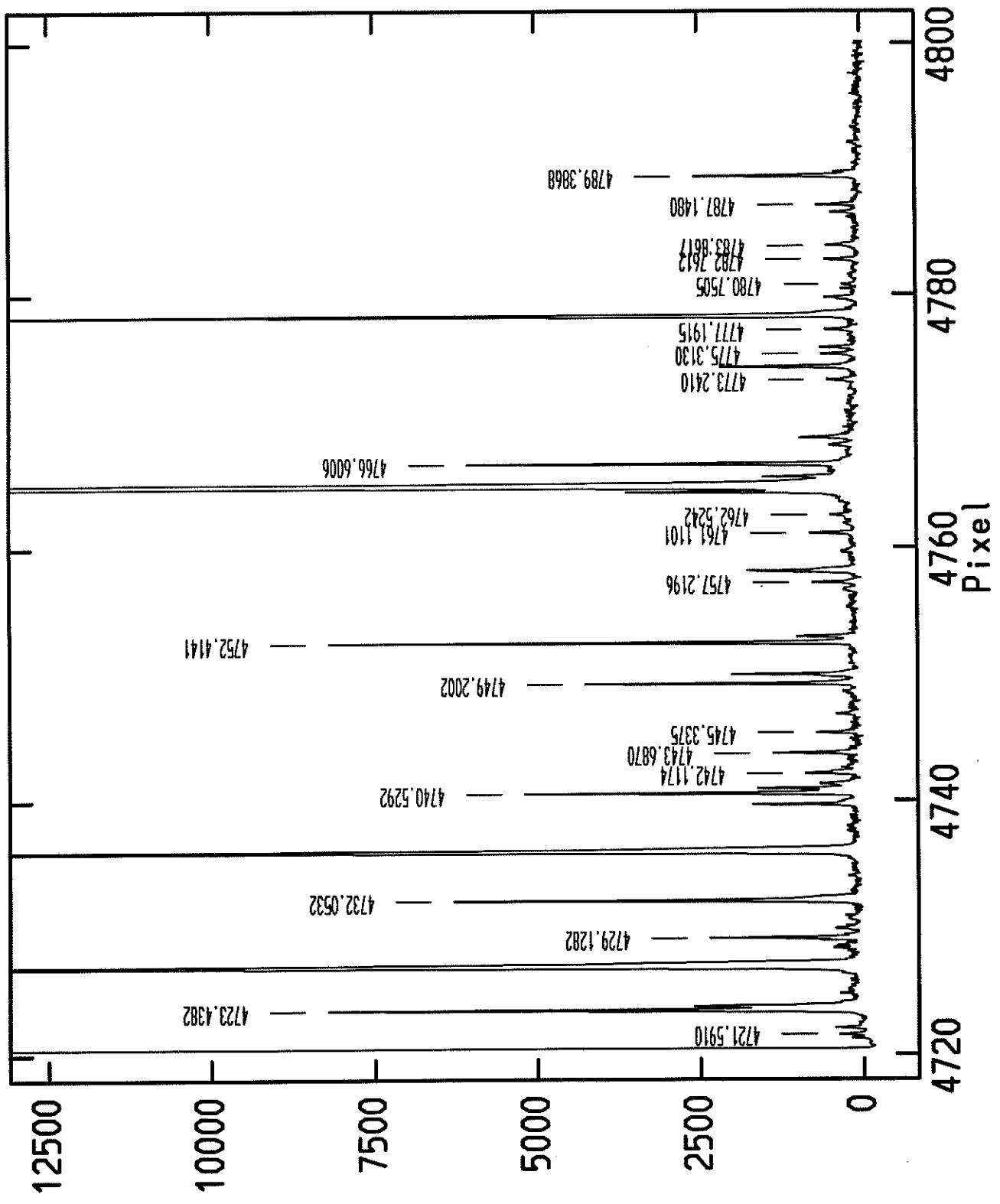
NGAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Thu 17:08:14 12-May-94
Aperture 64" Image Line 64: Order 118
Identify thar0066.r: th/ar



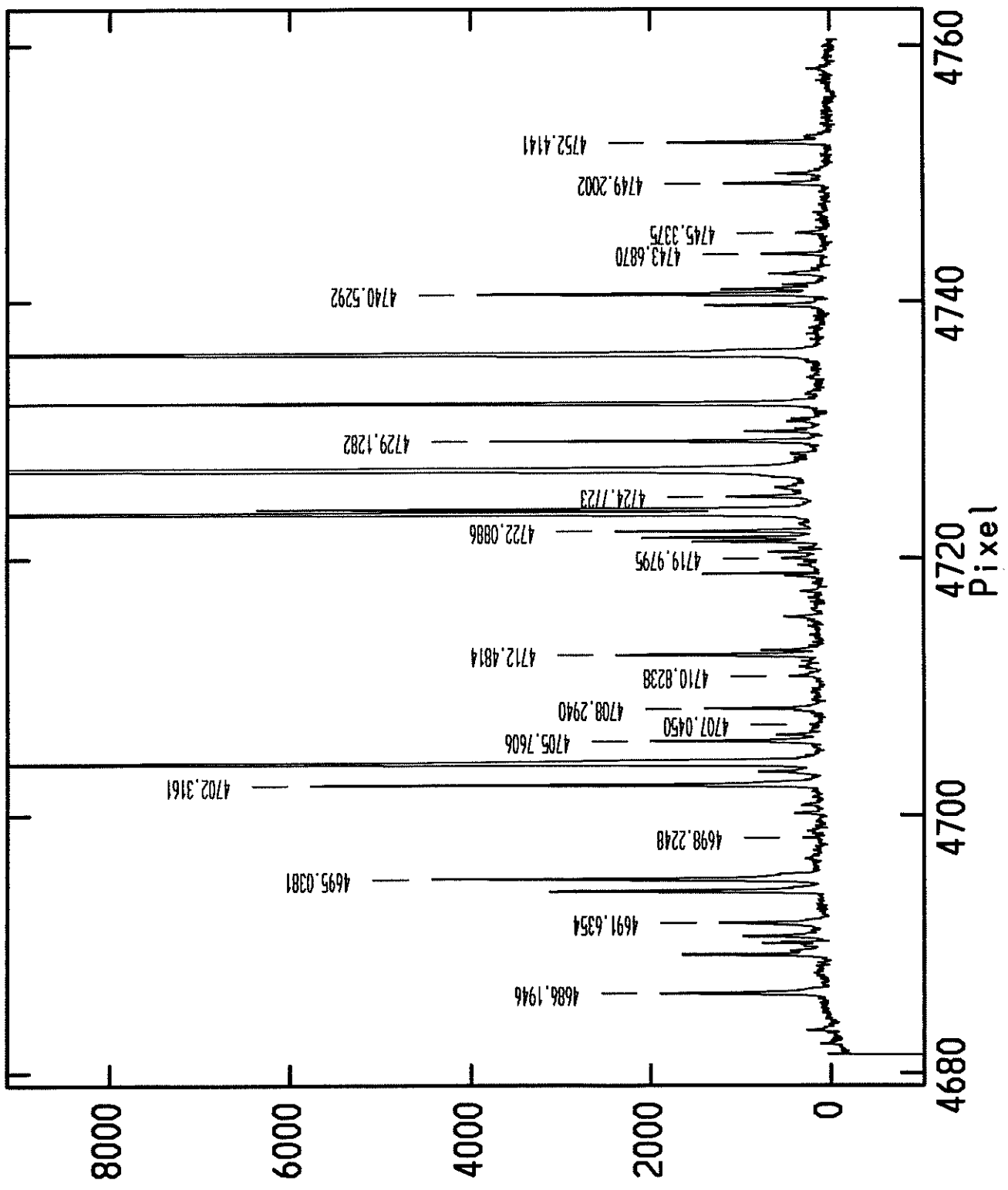
NOAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Mon 13:55:36 09-May-94
Aperture 65 Image Line 65 Order 119
Identify thar0066.r: th/ar



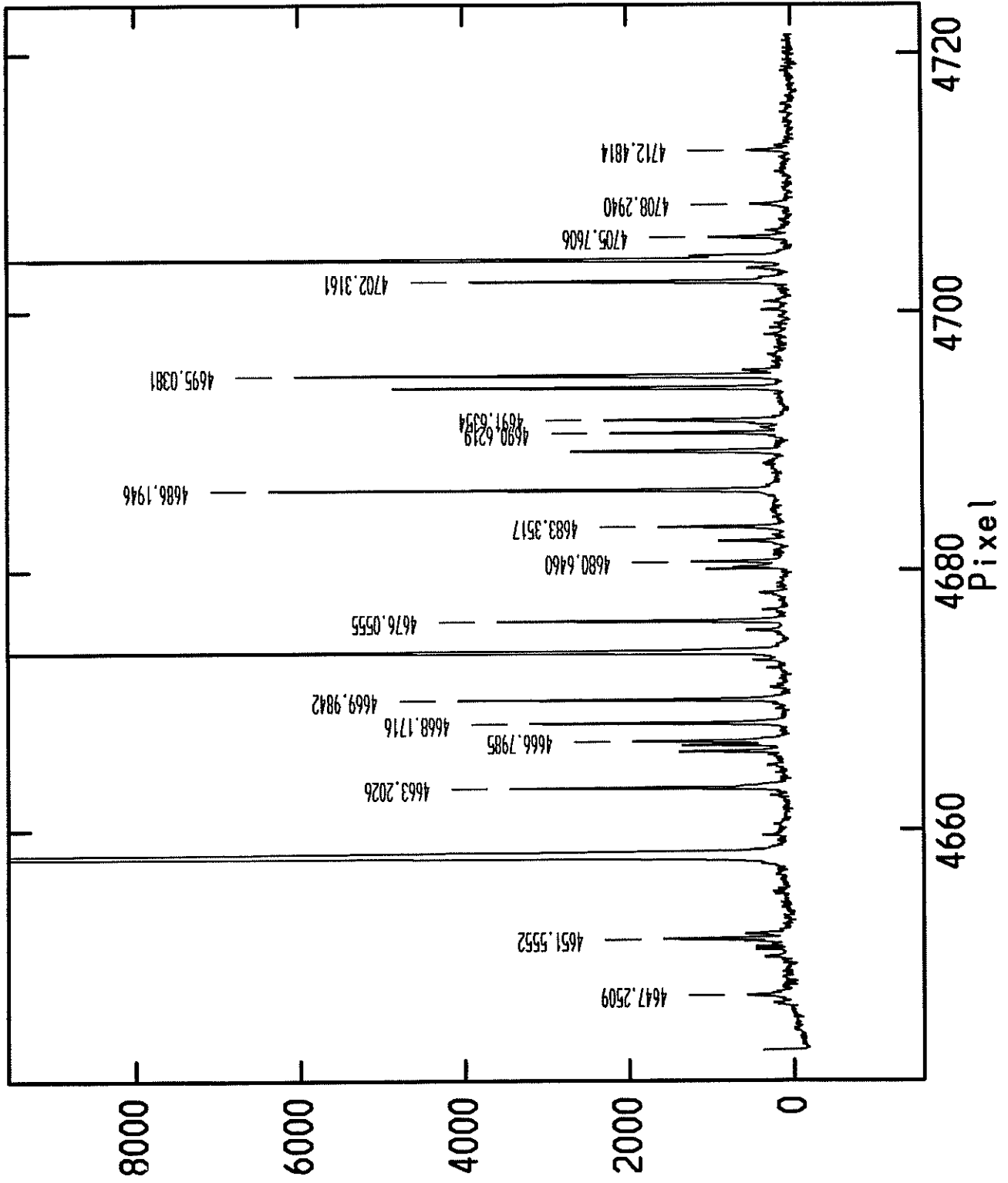
NGAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Thu 17:10:54 12-May-94
Aperture 66 Image Line 66 Order 120
identify thar0066.r: th/ar



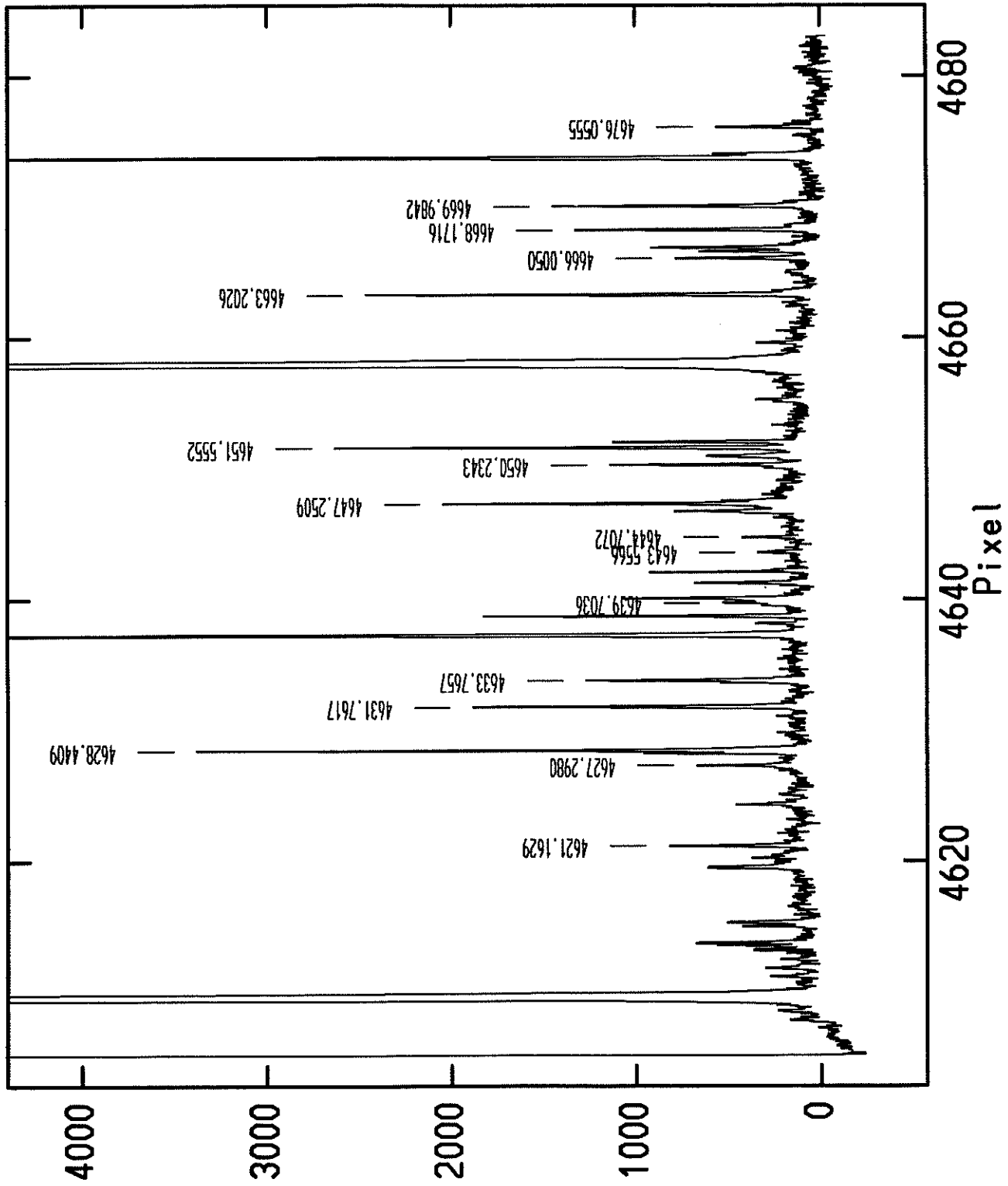
NOAO/IRAF V2.10EXPORT mdseverdi@ucsc.edu Thu 17:13:27 12-May-94
Aperture of Image Line 67 Order 121
identify thar0066.r: th/ar



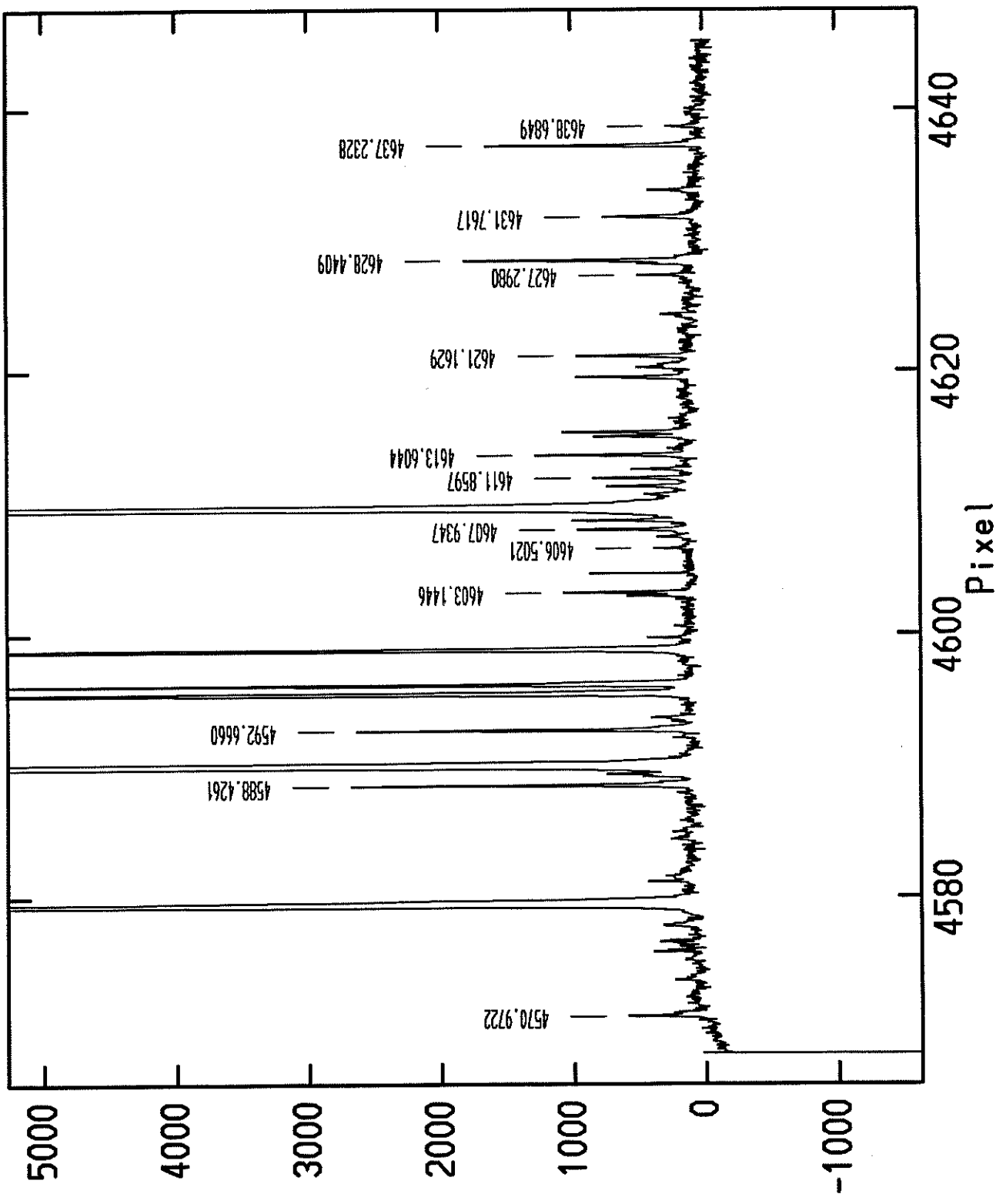
NGAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Thu 17:15:02 12-May-94
Aperture 68 Image Line 68 Order 122
identify thar0066.r: th/ar



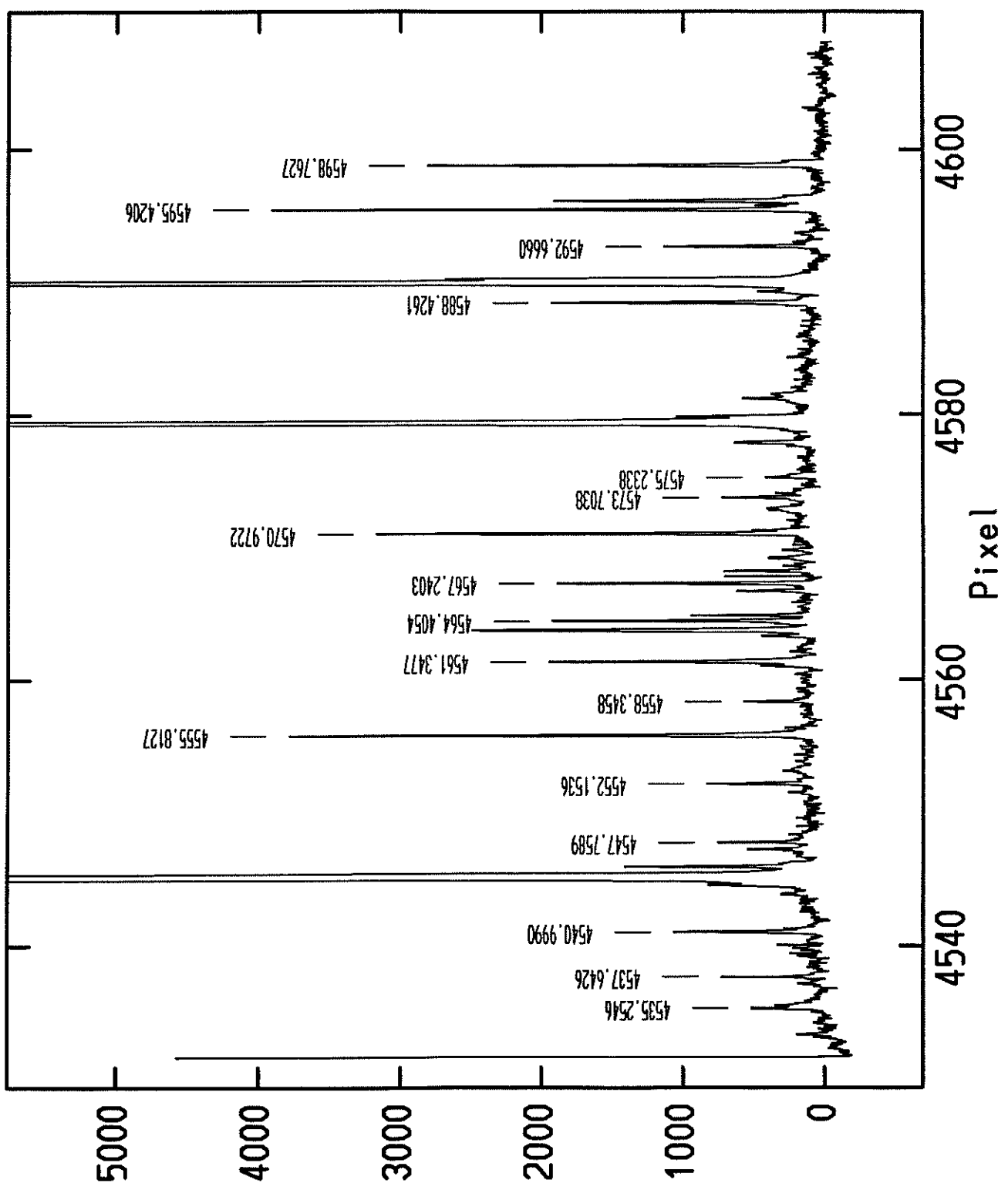
NGAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Thu 17:16:30 12-May-94
Aperture 69, Image line 69, Order 123
identify thar0066.r: th/ar



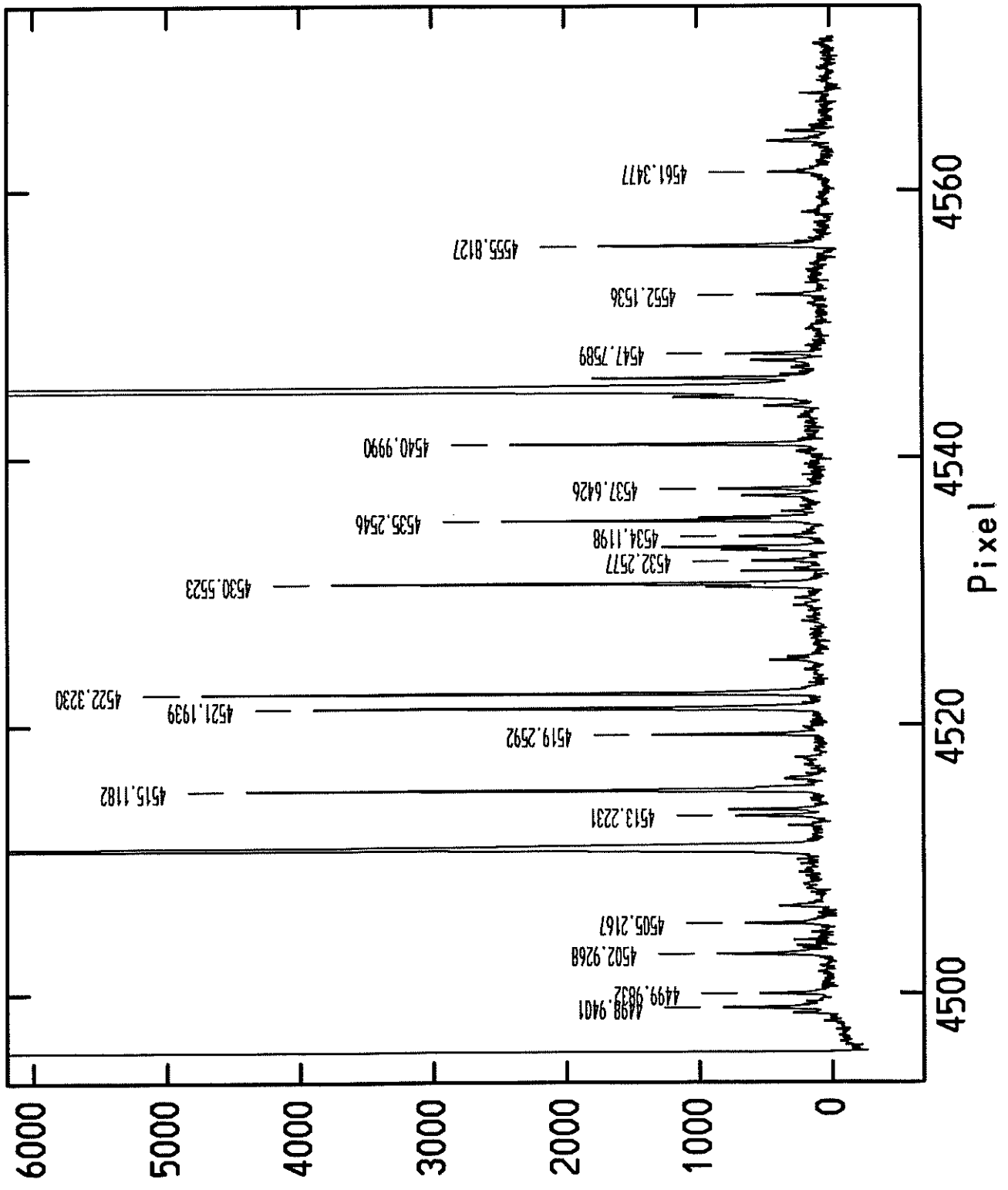
NOAO/IRAF V2.10EXPORT wdseverdi.ucsc.edu Mon 14:03:44 09-May-94
Aperture 70 Image Line 70 Order 124
Identify thar0066.r: th/ar



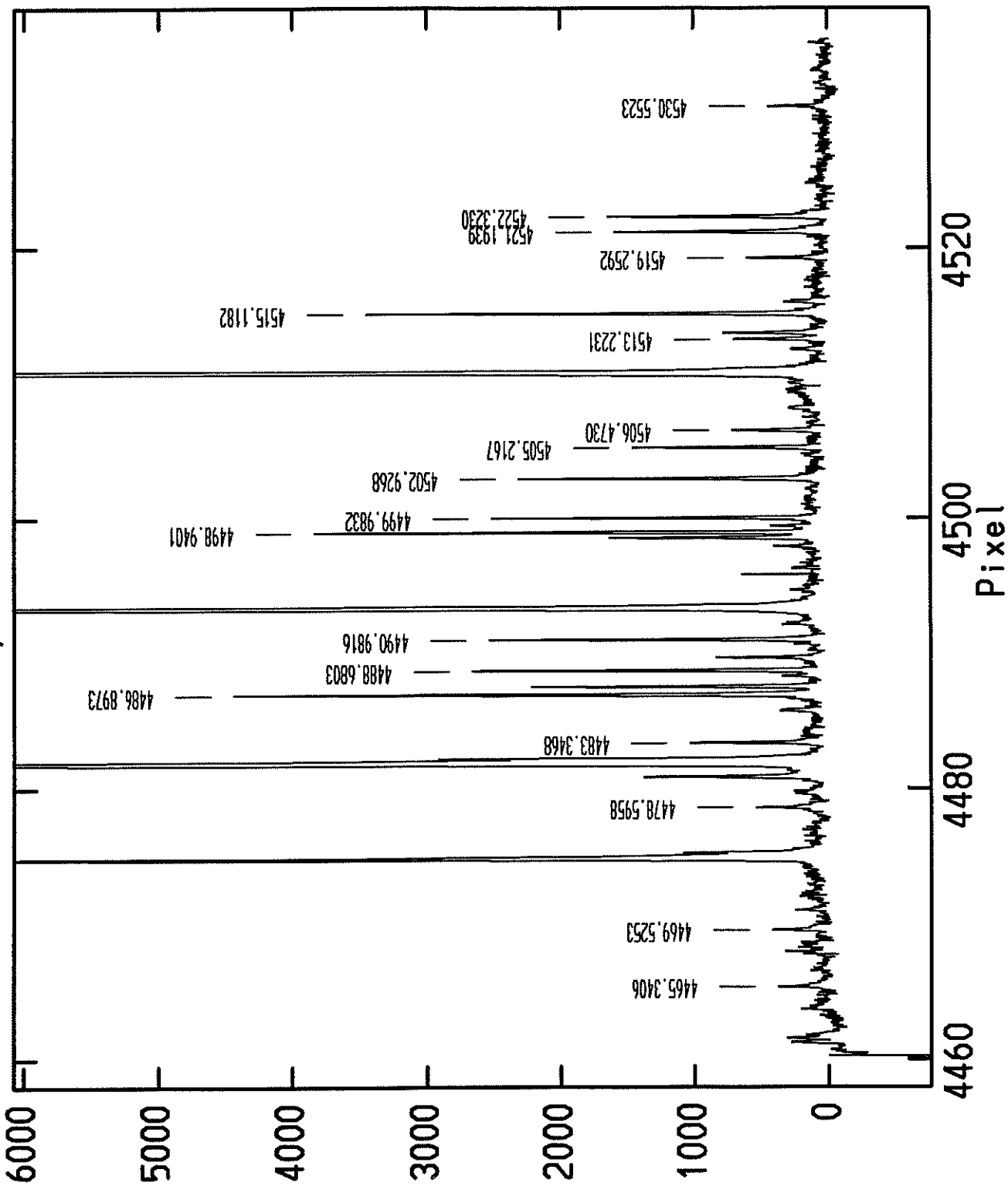
NGAO/IRAF V2.10EXPORT mdseverdi.UCSC.EDU Mon 14:04:55 09-May-94
Aperture 71 Image file 71 Order 125
Identify thar0066.r: th/ar



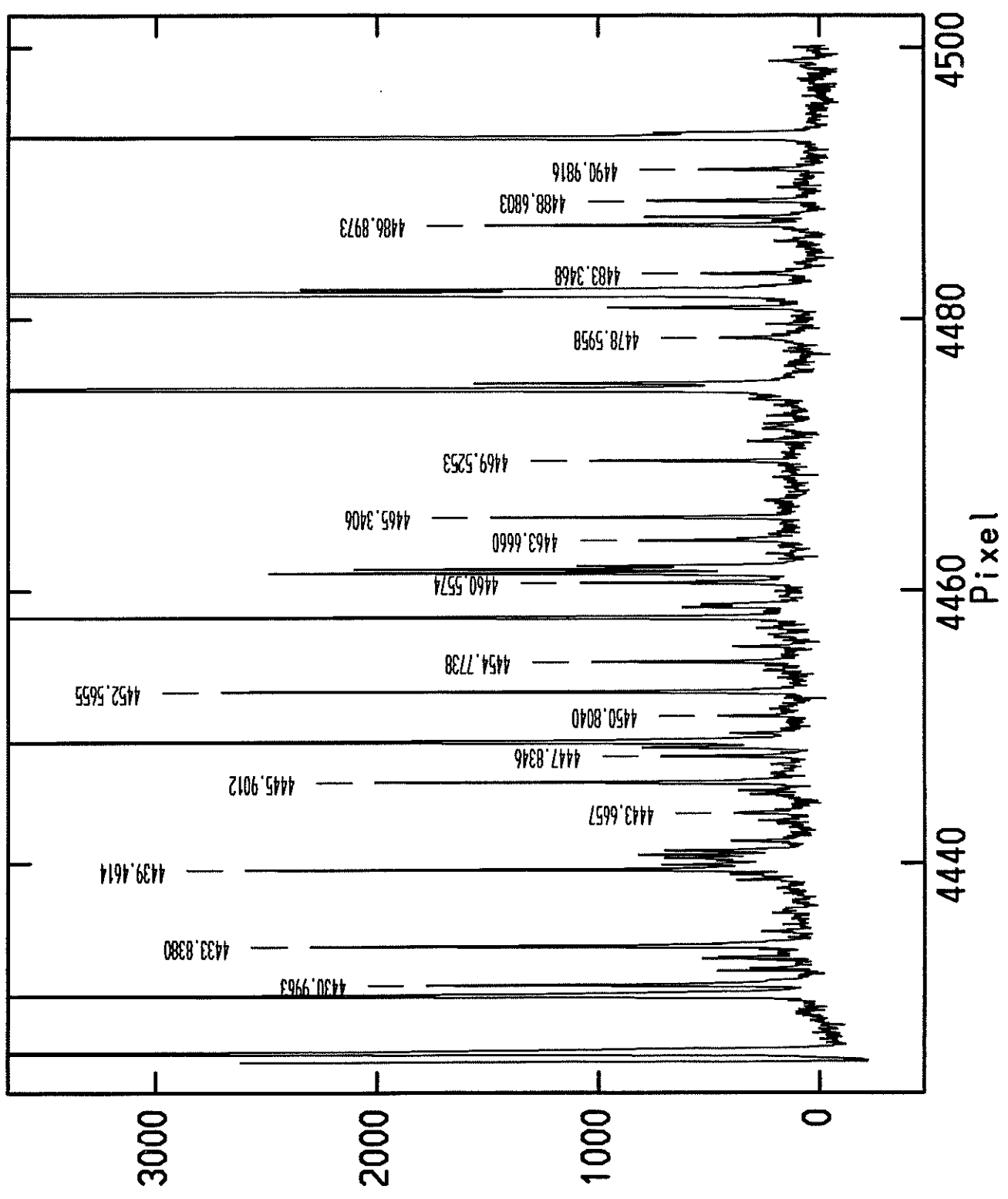
NOAO/IRAF V2.10EXPORT nds@verdi.ucsc.edu Mon 14:06:23 09-May-94
Aperture 72 Image Line 72 Order 126
Identify thar0066.r: th/ar



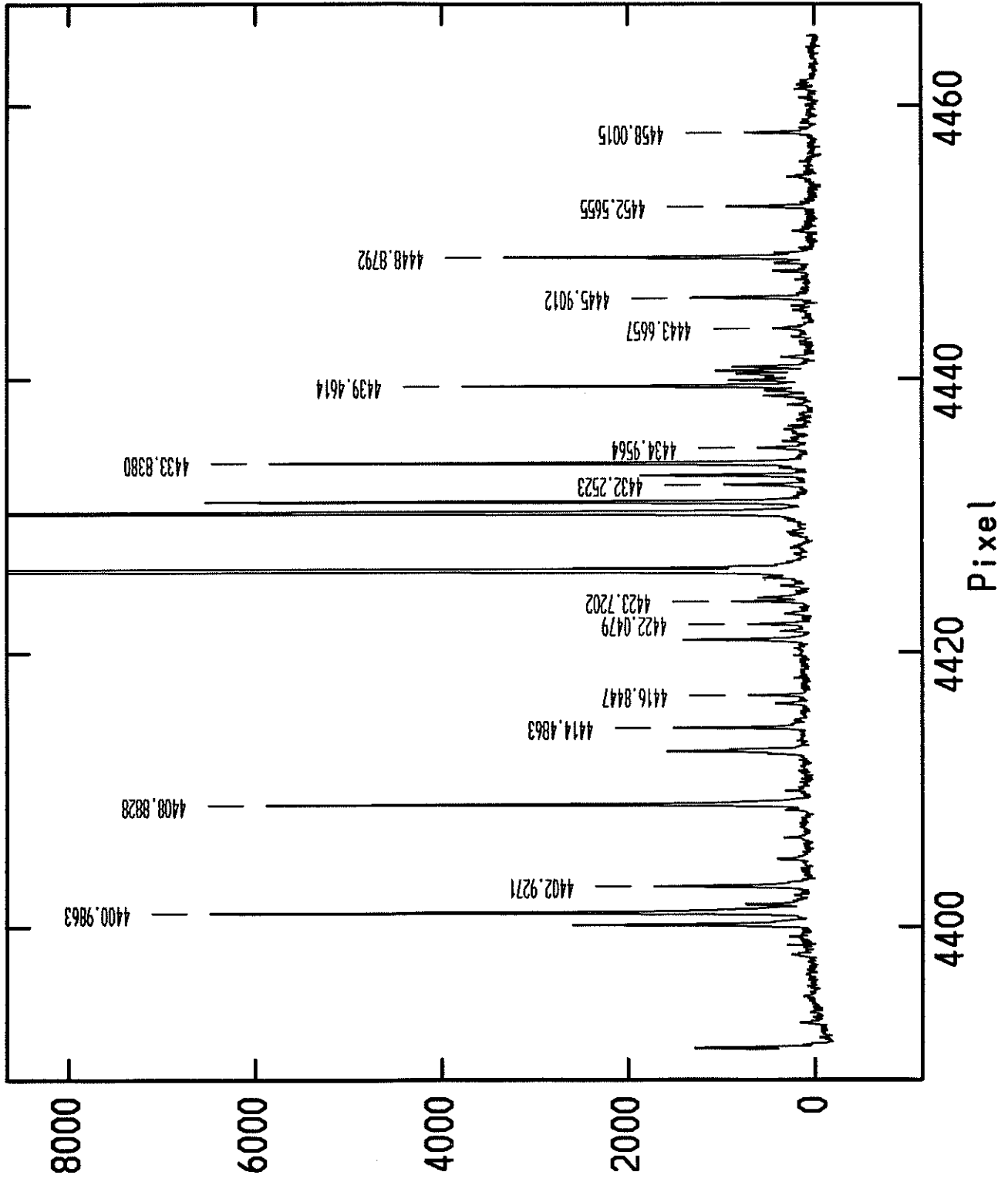
NOAO/IRAF V2.10EXPORT mgs@verdi.ucsc.edu Mon 14:07:54 09-May-94
Aperture 73 Image file 73 Order 127
identify char 0066.r: th/ar



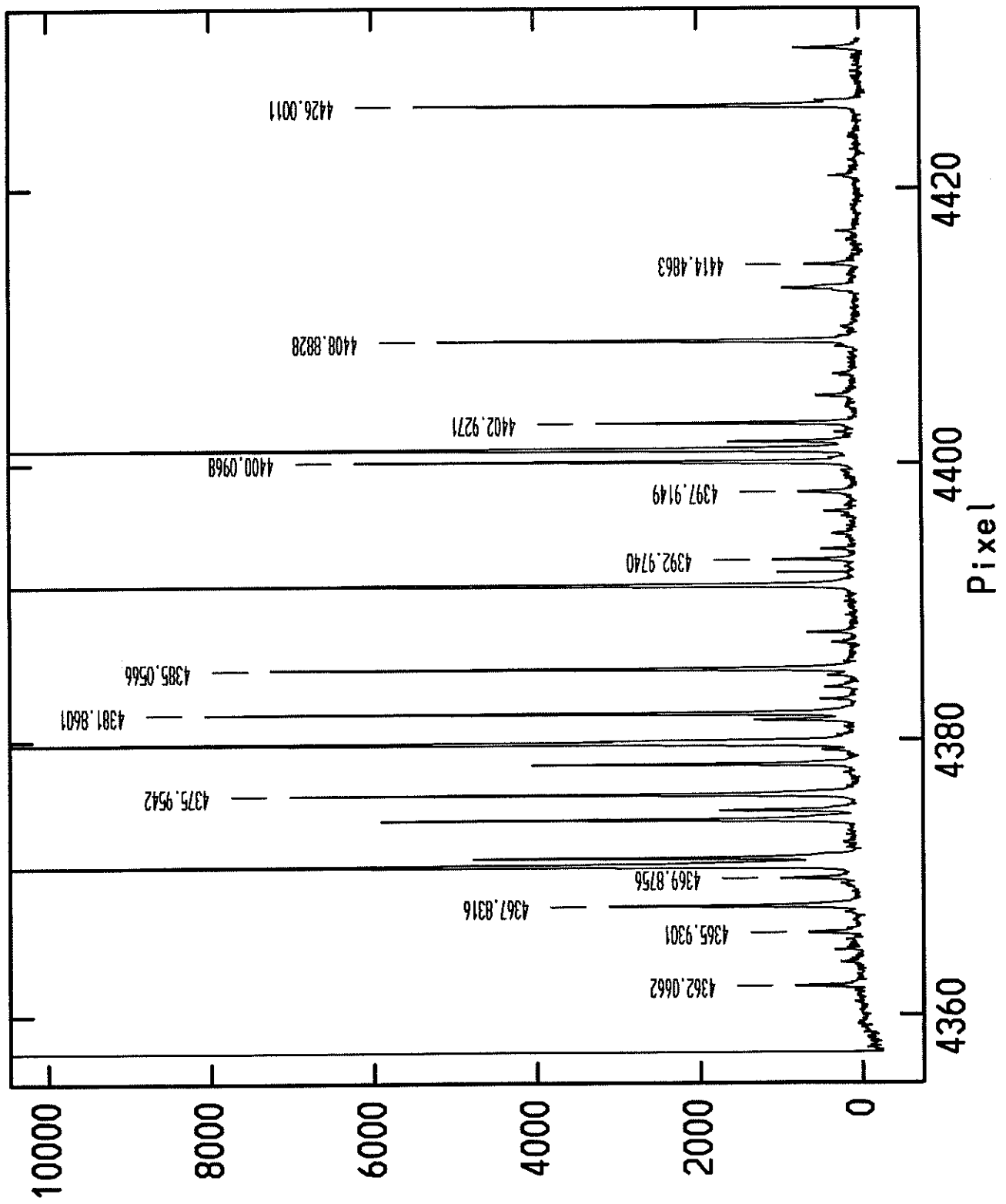
NOAO/IRAF V2.10EXPORT mdseverdi.ucsc.edu Mon 14:09:23 09-May-94
Aperture 74 Image Line 74 Order 128
identify thar0066.r: th/ar



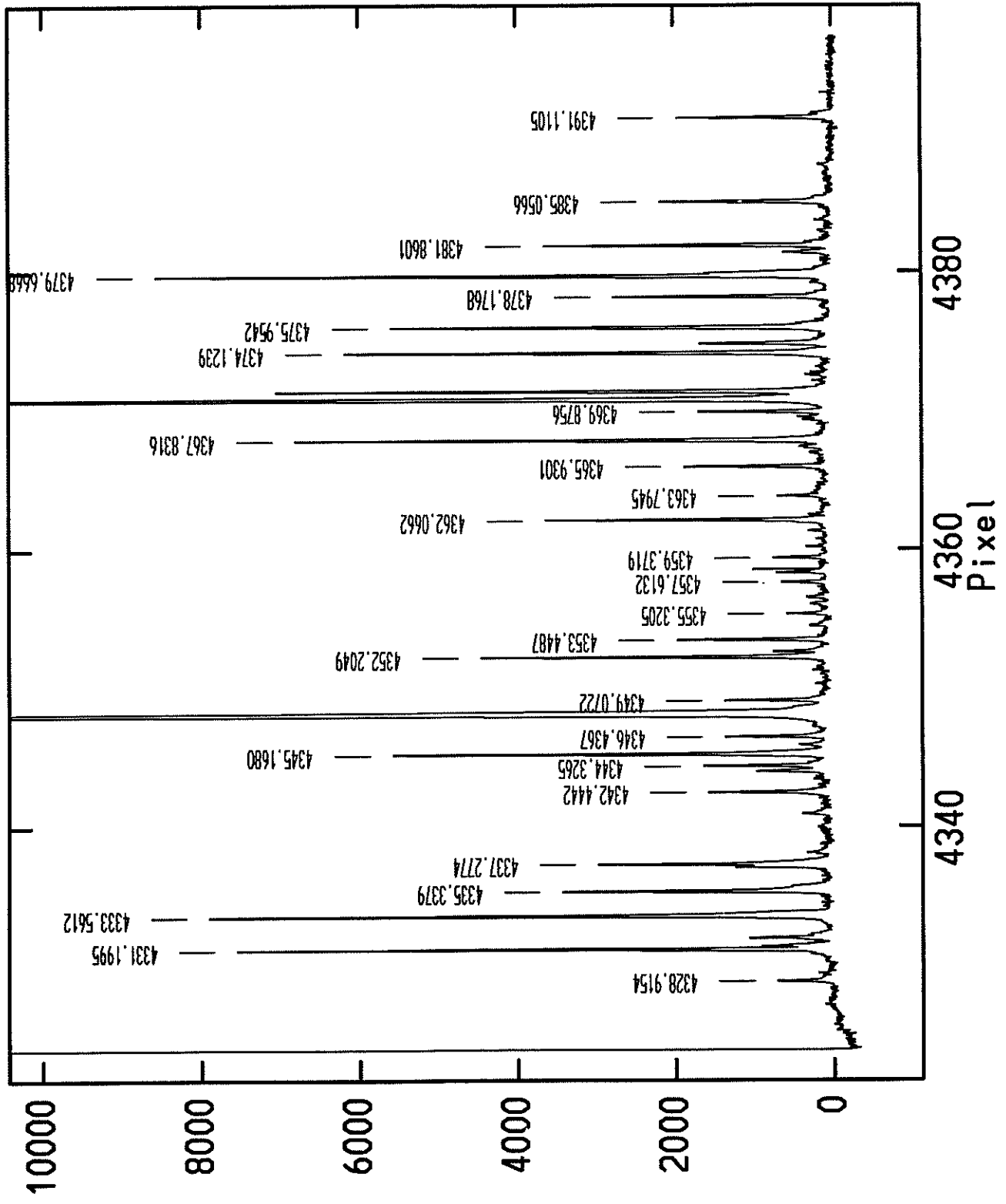
NOAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Mon 14:11:04 09-May-94
Aperture 75" Image Line 75 Order 129
identify thar0066.r: th/ar



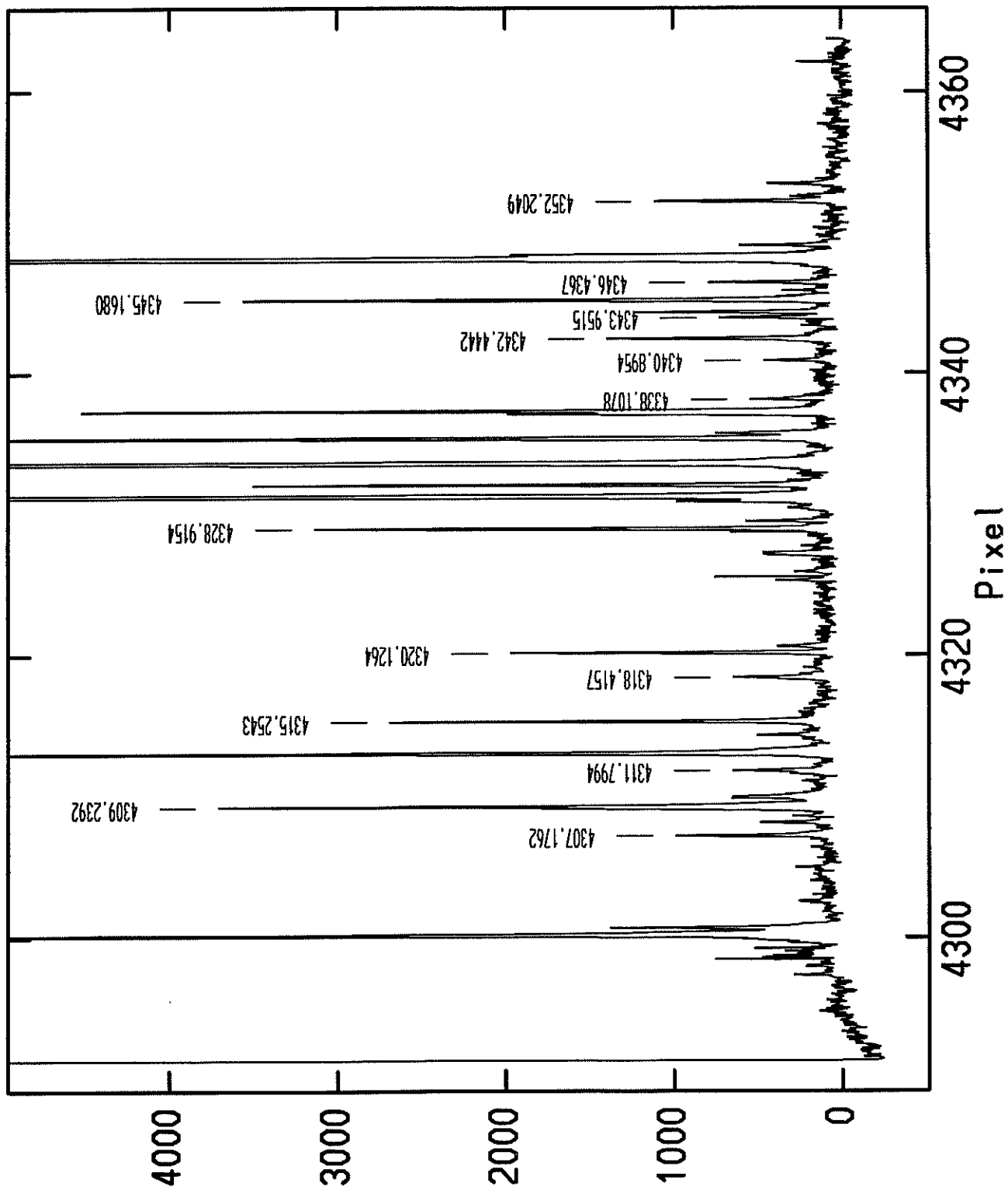
NOAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Mon 14:12:22 09-May-94
Aperture 76 Image Line 76 Order 130
Identify thar0066.r: th/ar



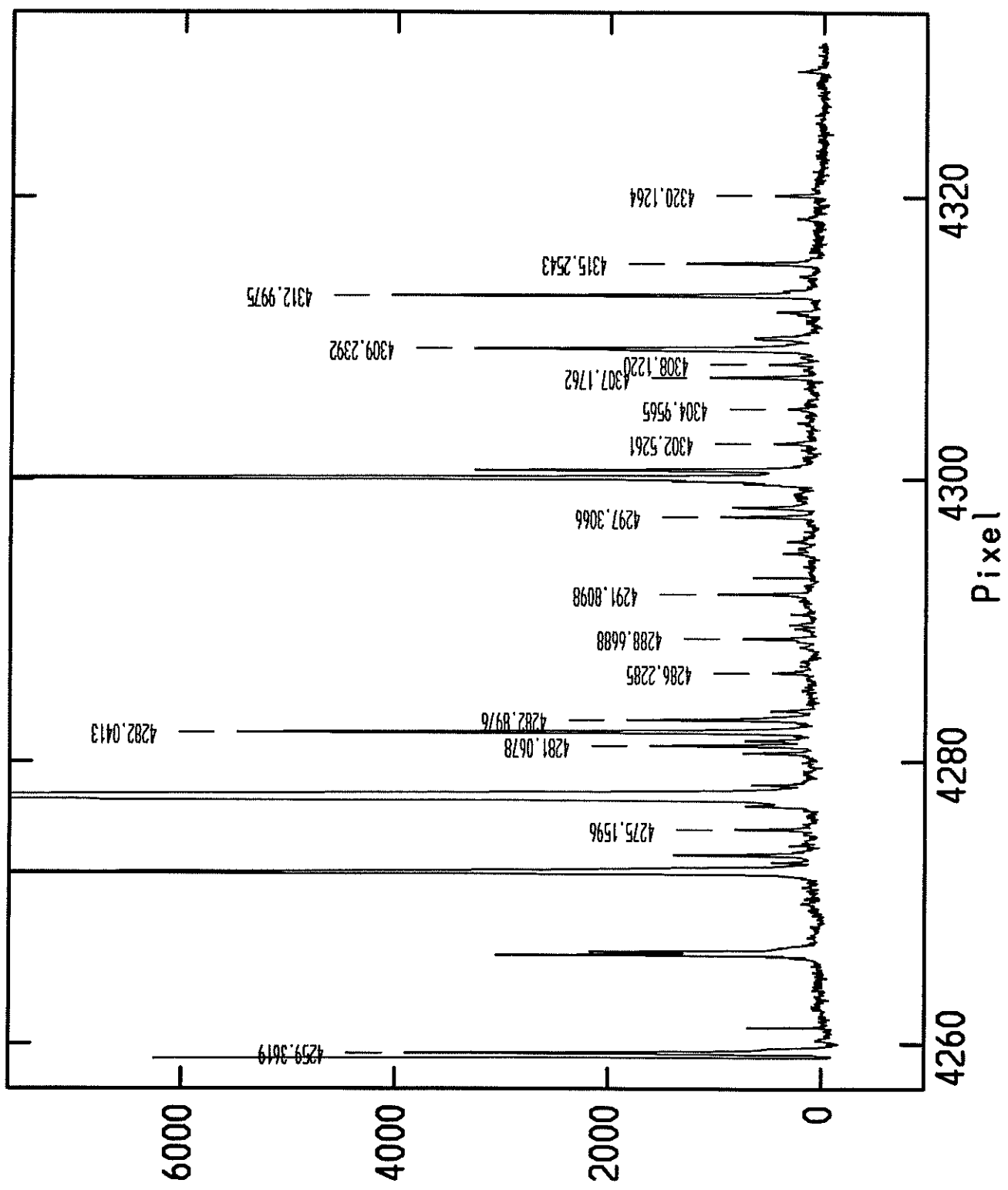
NOAO/IRAF V2.10EXPORT mdseverdi@ucsc.edu Mon 14:13:43 09-May-94
Aperture 77 Image file 77 Order 131
identify thar0066.r: th/ar



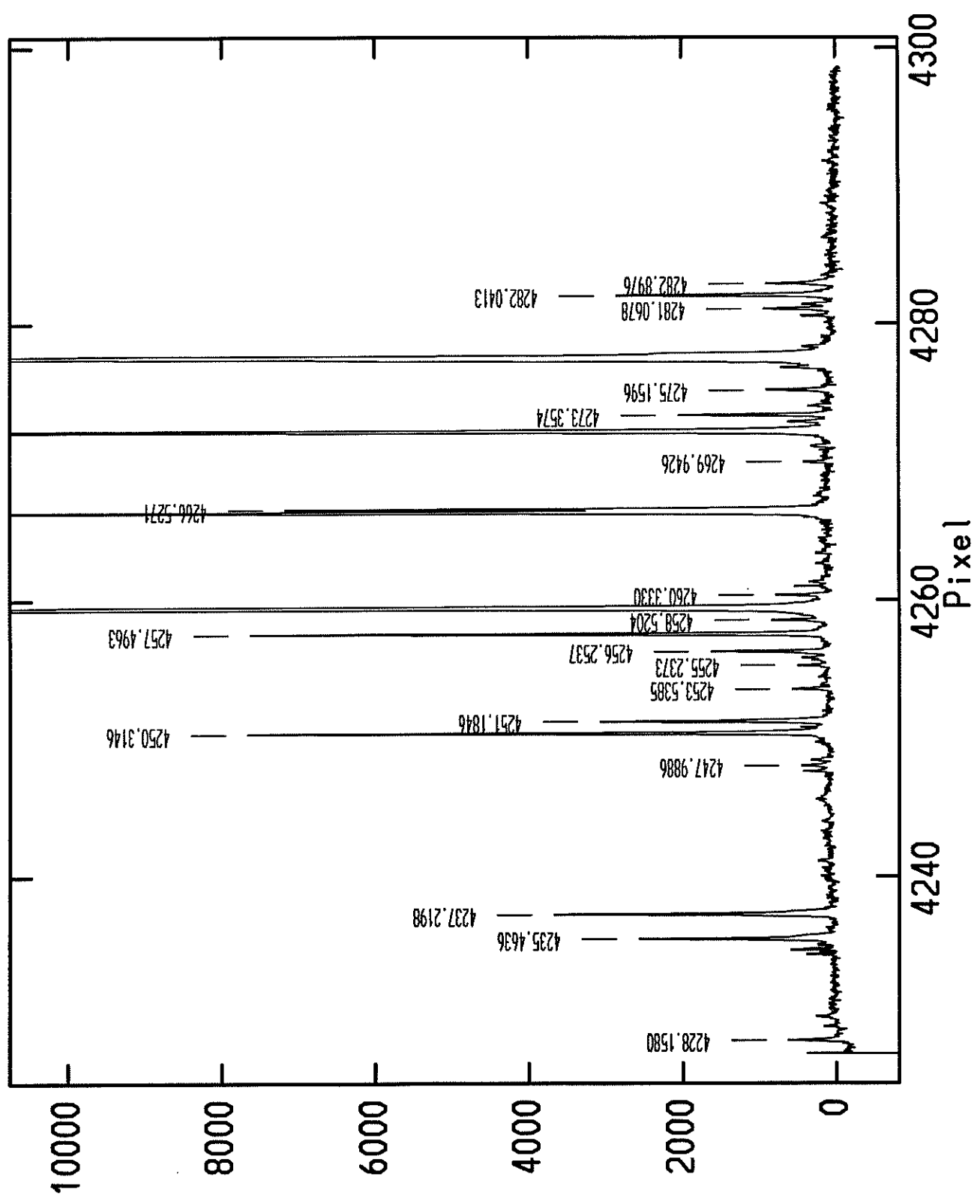
NOAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Mon 14:15:05 09-May-94
Aperture 78 Image Line 78 Order 132
Identify thar0066.r: th/ar



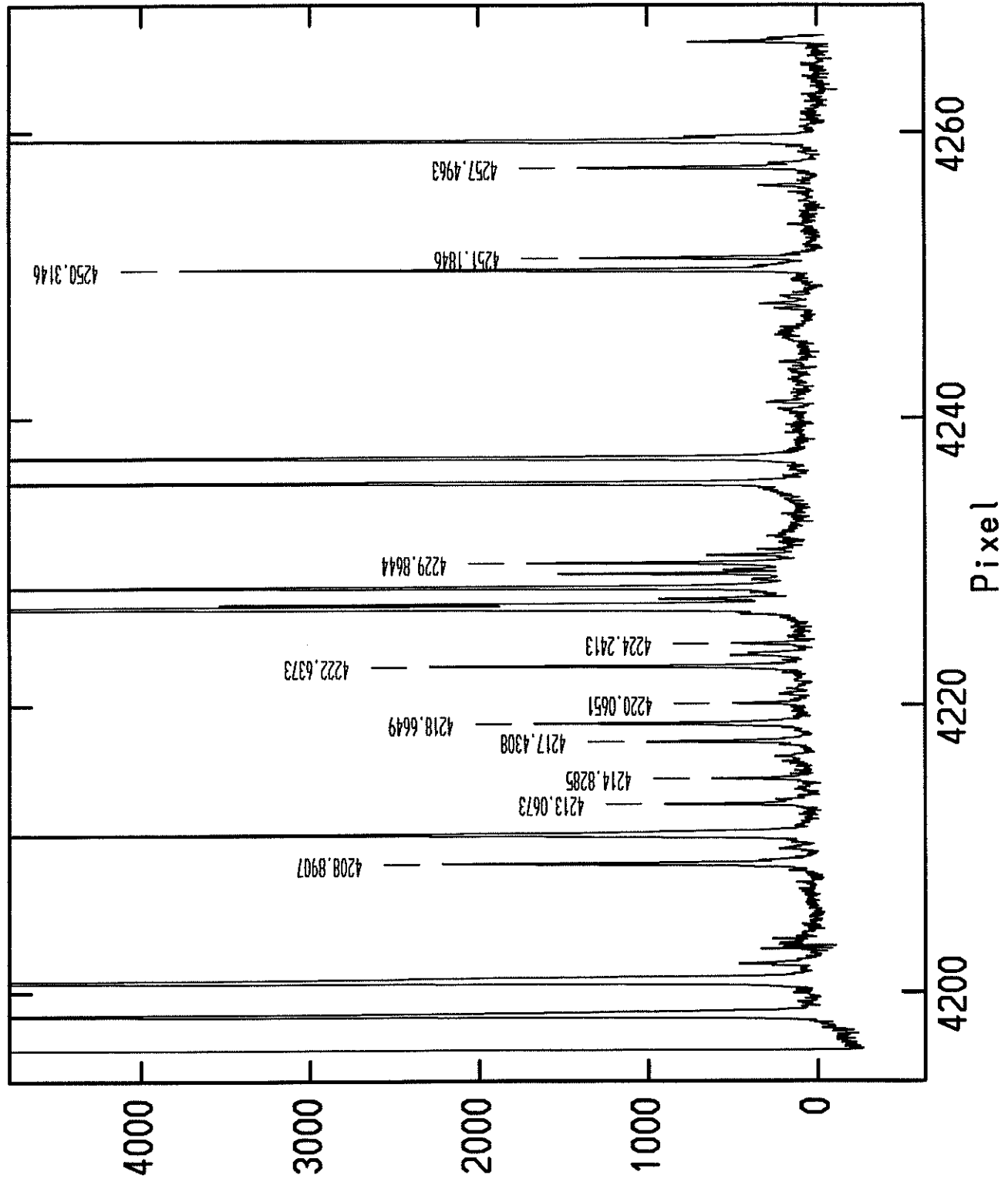
NOAO/IRAF V2.10EXPORT mds@verdi.ucsc.edu Mon 14:16:16 09-May-94
Aperture 79 Image Line 79 Order 133
identify thar0066.r: th/ar



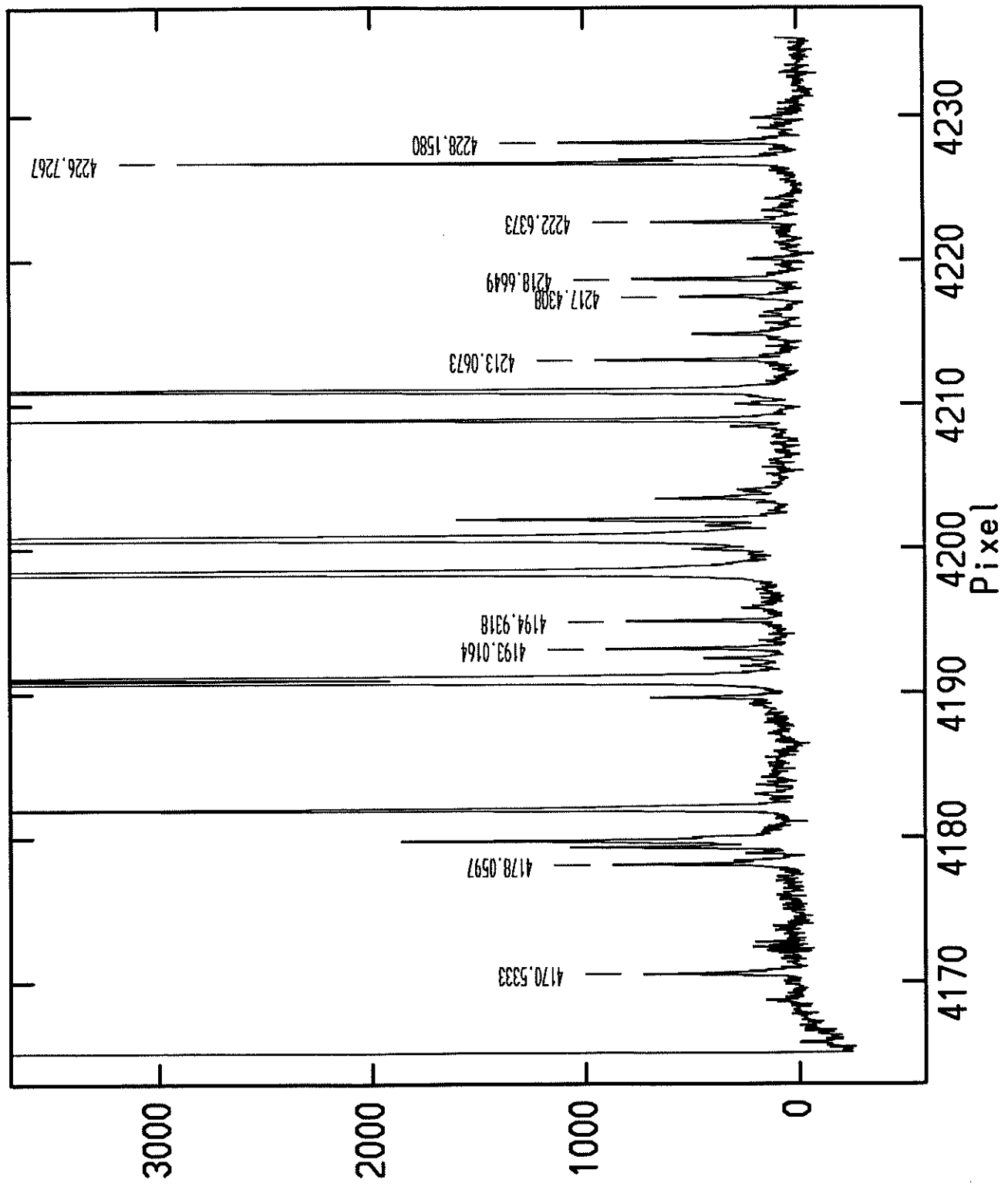
NGAO/IRAF V2.10EXPORT Wds@verdi.ucsc.edu Mon 14:17:28 09-May-94
Aperture 80 Image Line 80 Order 134
Identify thar0066.r: th/ar



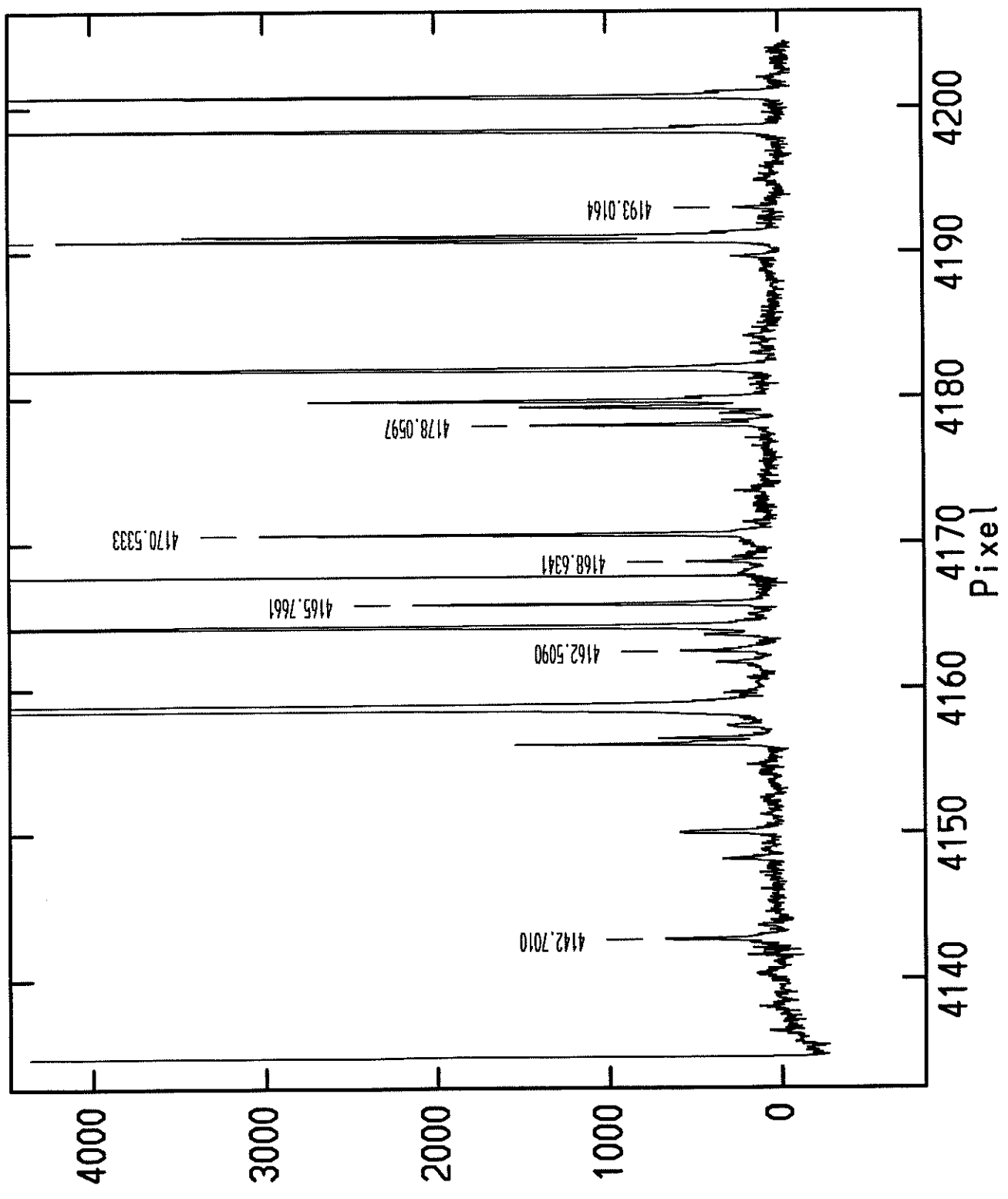
NOAO/IRAF V2.10EXPORT pds@verdi.ucsc.edu Mon 14:18:45 09-May-94
Aperture 81 Image Line 81 Order 135
identify thar0066.r: th/ar



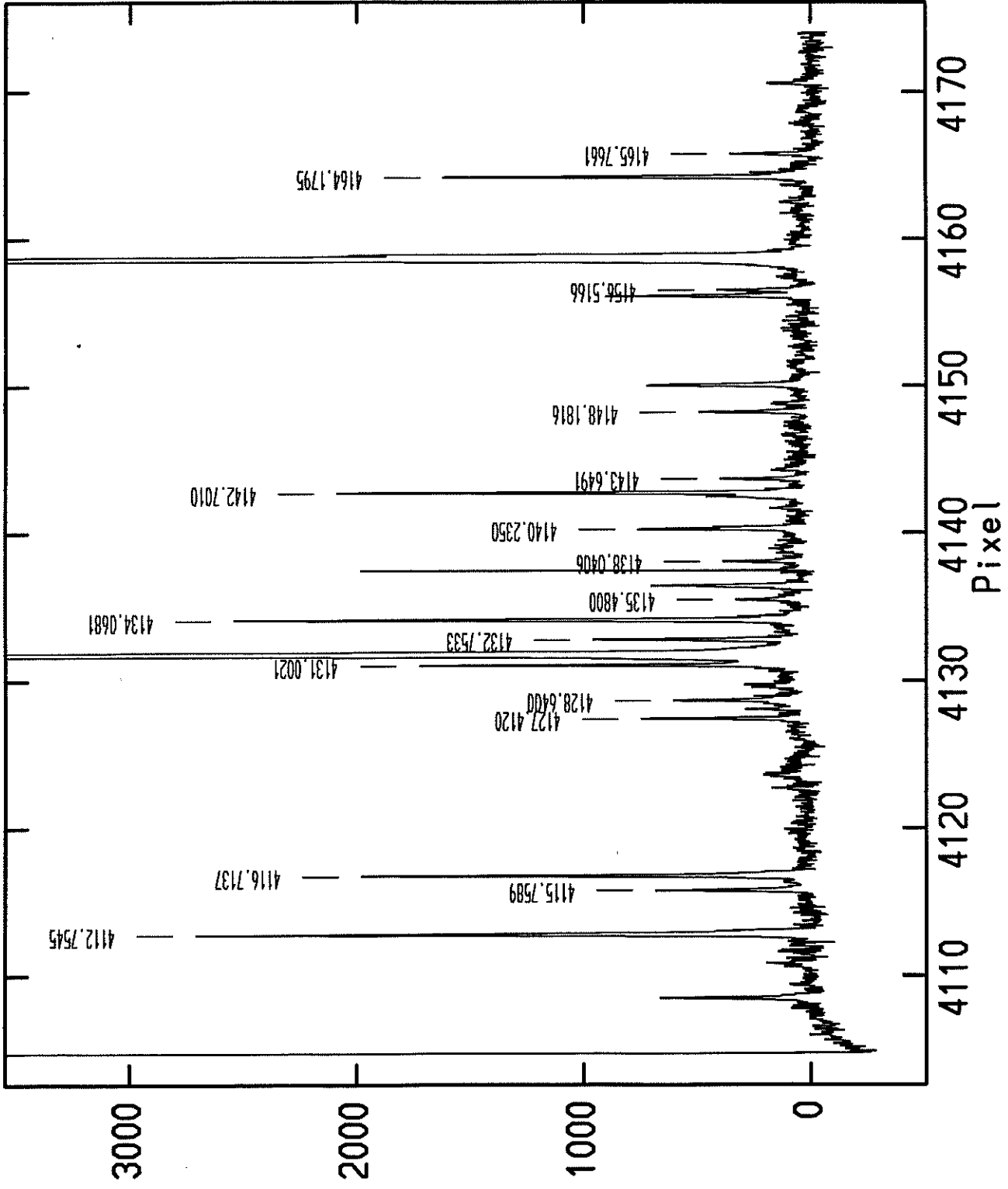
NOAO/IRAF V2.10EXPORT gds@verdi.ucsc.edu Mon 14:19:52 09-May-94
Aperture 82 Image Line 82 Order 136
Identify thar0066.r: th/ar



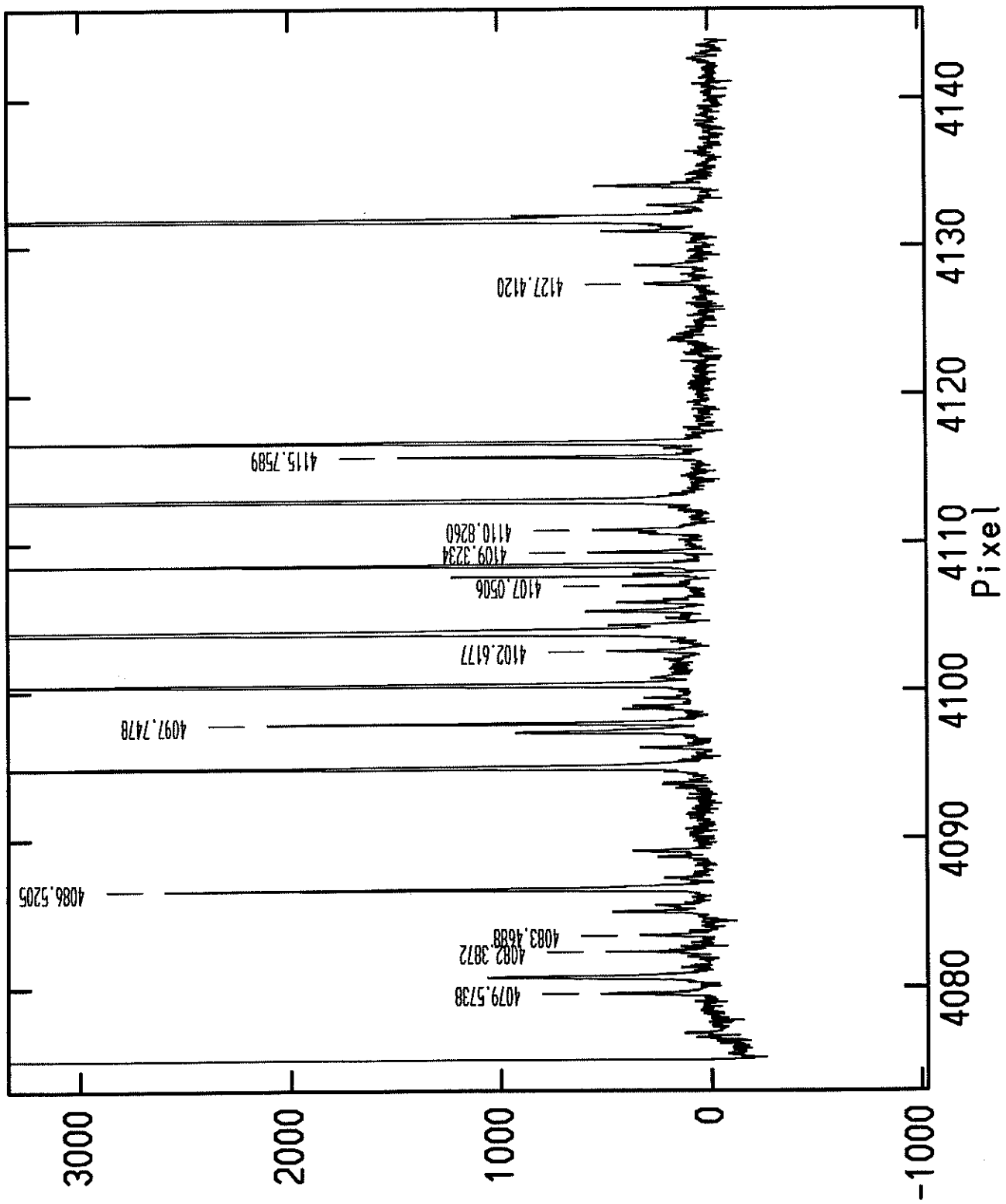
NOAO/IRAF V2.10EXPORT V2.10EXPORT gds@verdi.ucsc.edu Mon 14 May 1994 09:21:10
Aperture 83 Image Line 83 Order 37
identify thar0066.r: th/ar

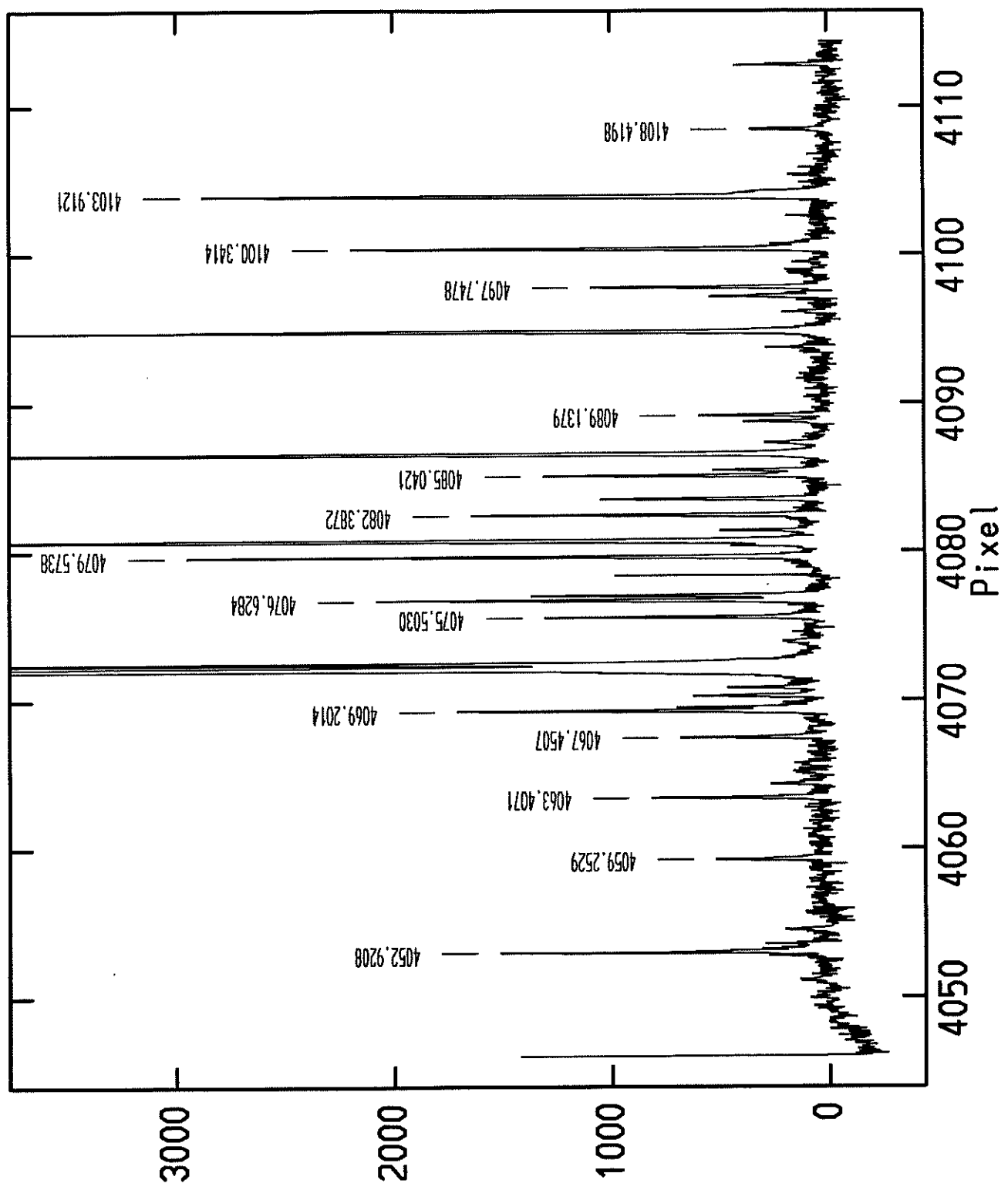


NOAO/IRAF V2.10EXPORT Wds@verdi.ucsc.edu Mon 14:22:10 09-May-94
Aperture 84 Image Line 84 Order 138
identify thar0066.r: th/ar

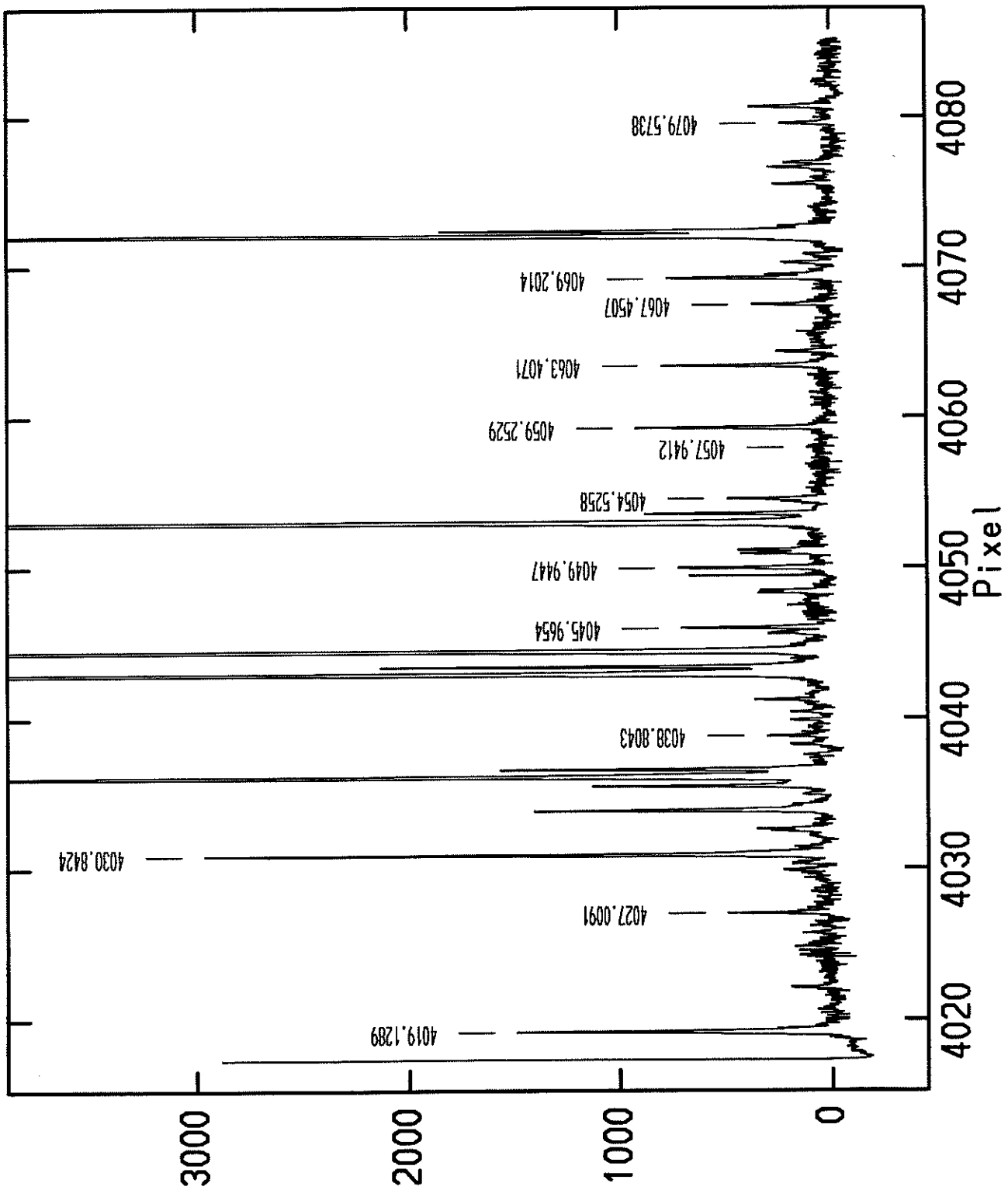


NGAO/IRAF V2.10EXPORT gds@verdi.ucsc.edu Mon 14:23:23 09-May-94
Aperture 85 Image Line 85 Order 139
Identify thar0066.r: th/ar

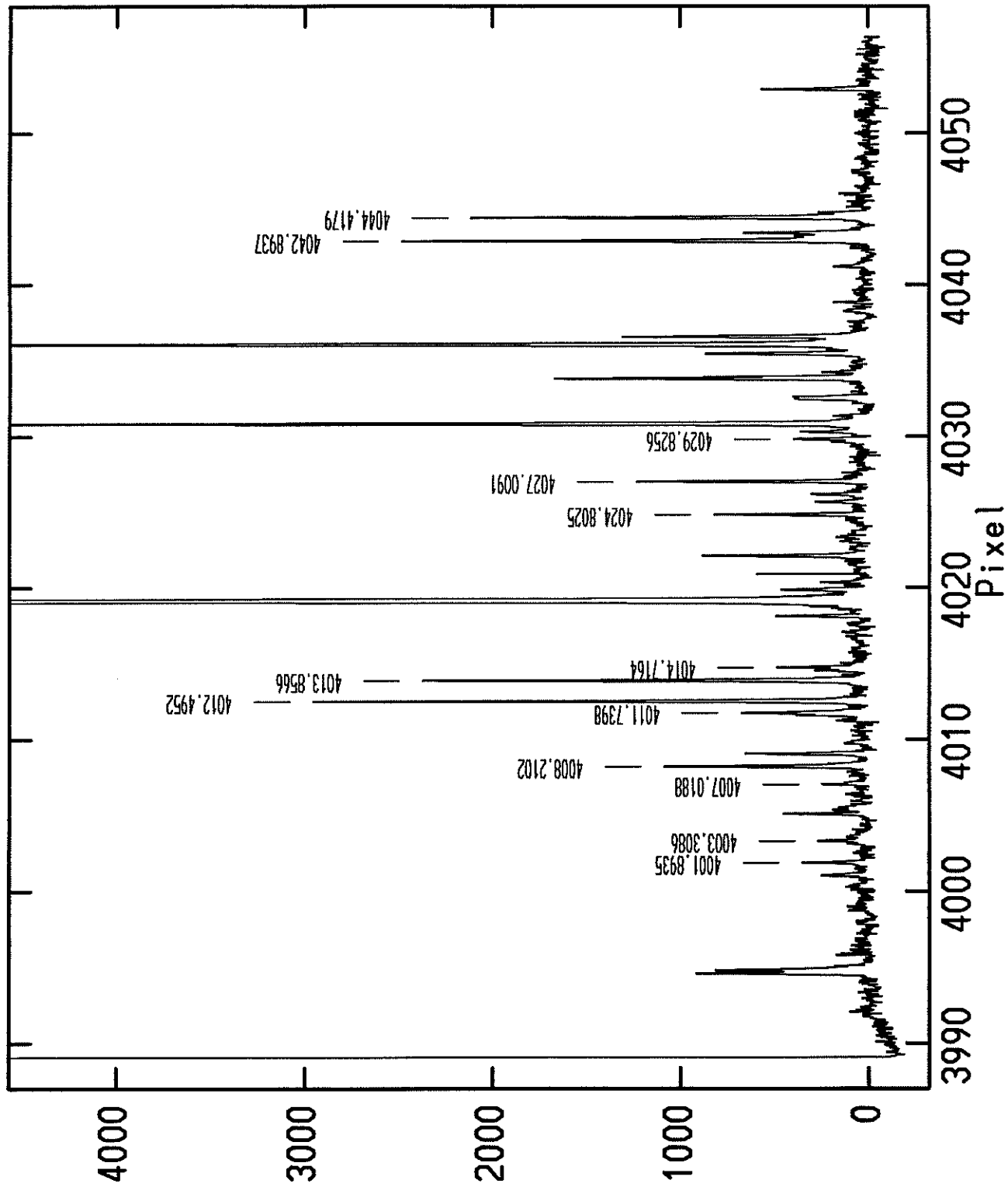




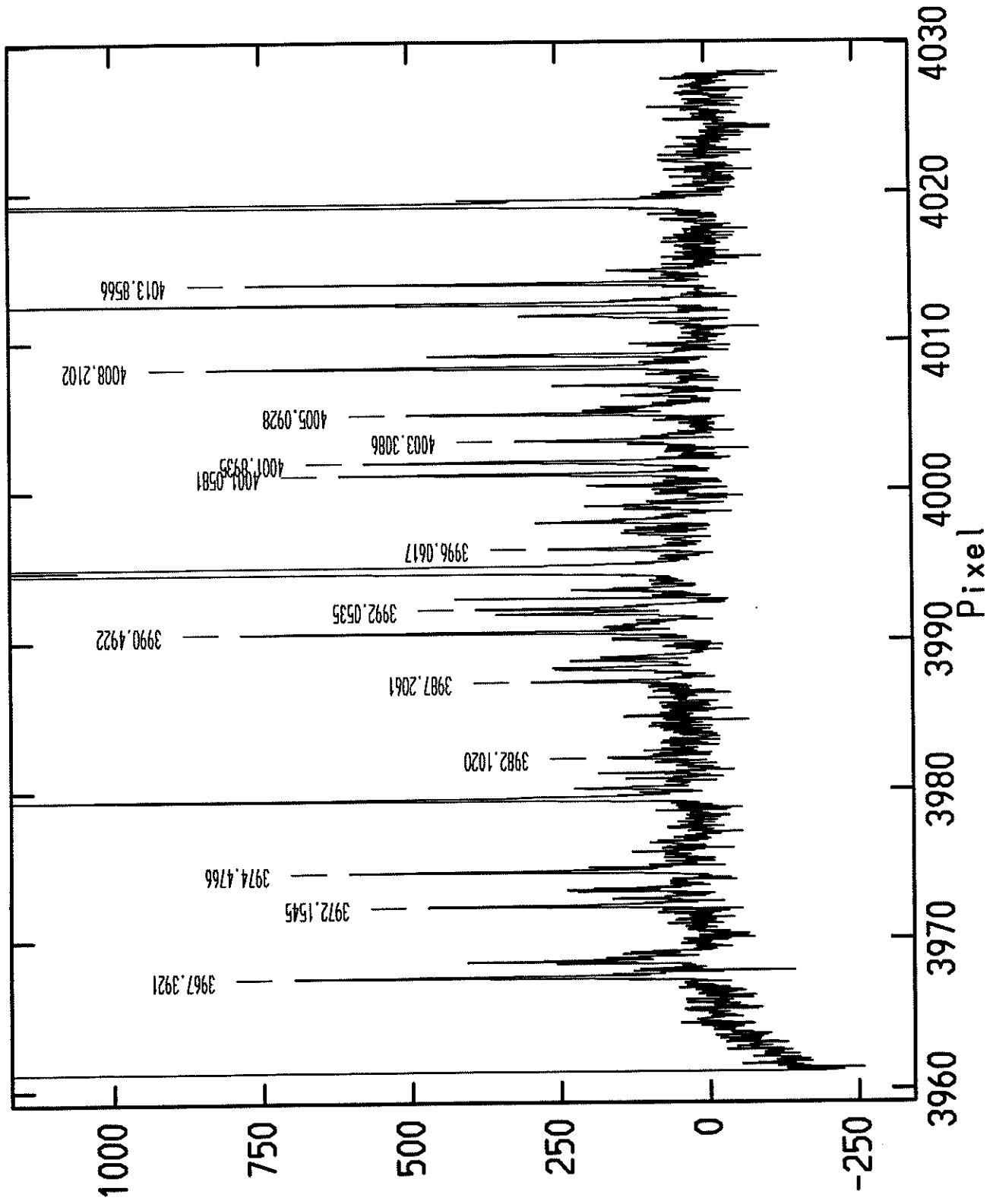
NOAO/IRAF V2.10EXPORT gdseverdi.UCSC.EDU Mon 14:26:20 09-May-94
Aperture 8/Image Line 87/Order 141
identify thar0066.r: th/ar



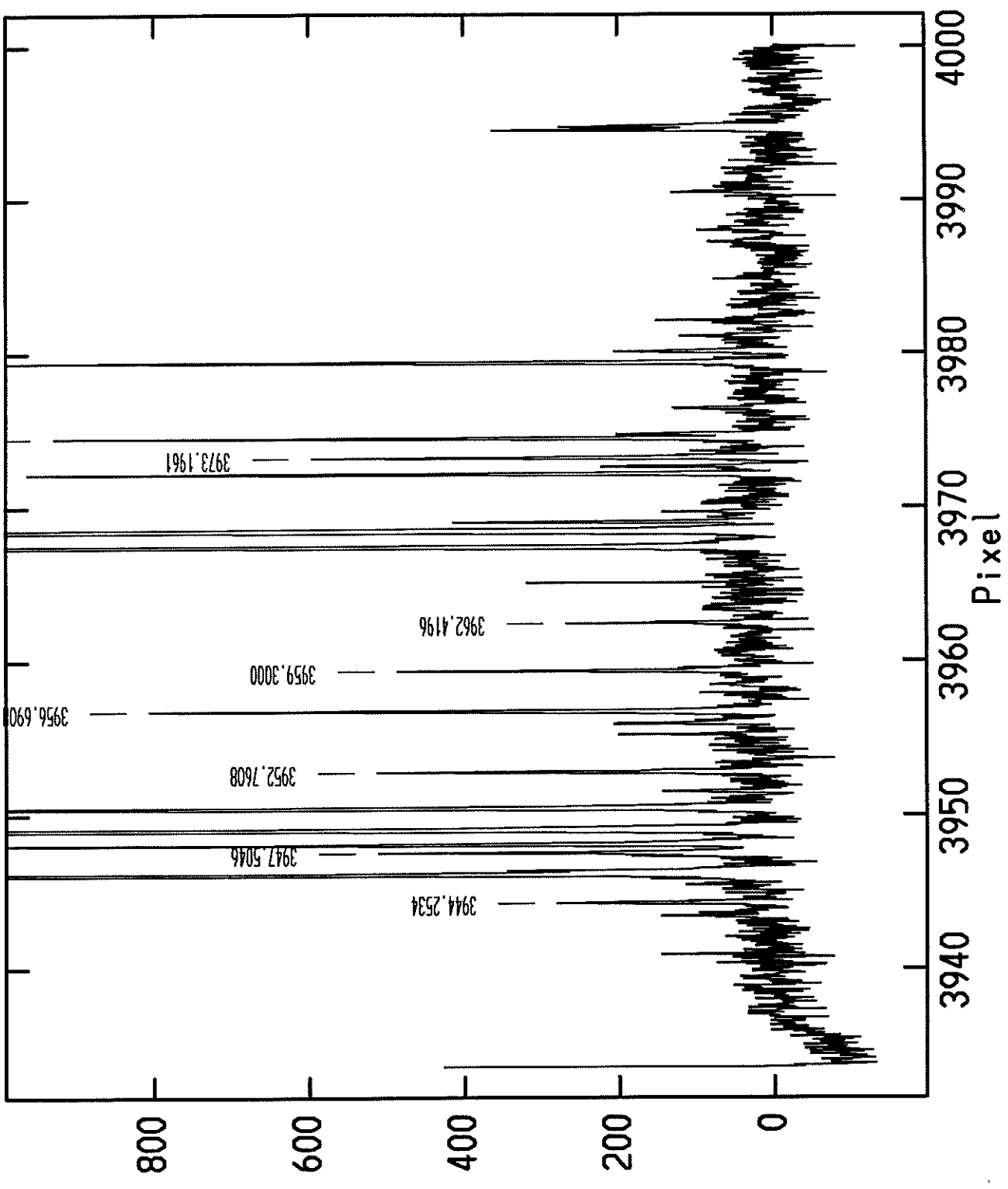
NOAO/IRAF V2.10EXPORT ~~gs~~seyedi.UCSC.EDU Mon 14:28:40 09-May-94
Aperture 88; Image Line 88; Order 142
identify thar0066.r: th/ar



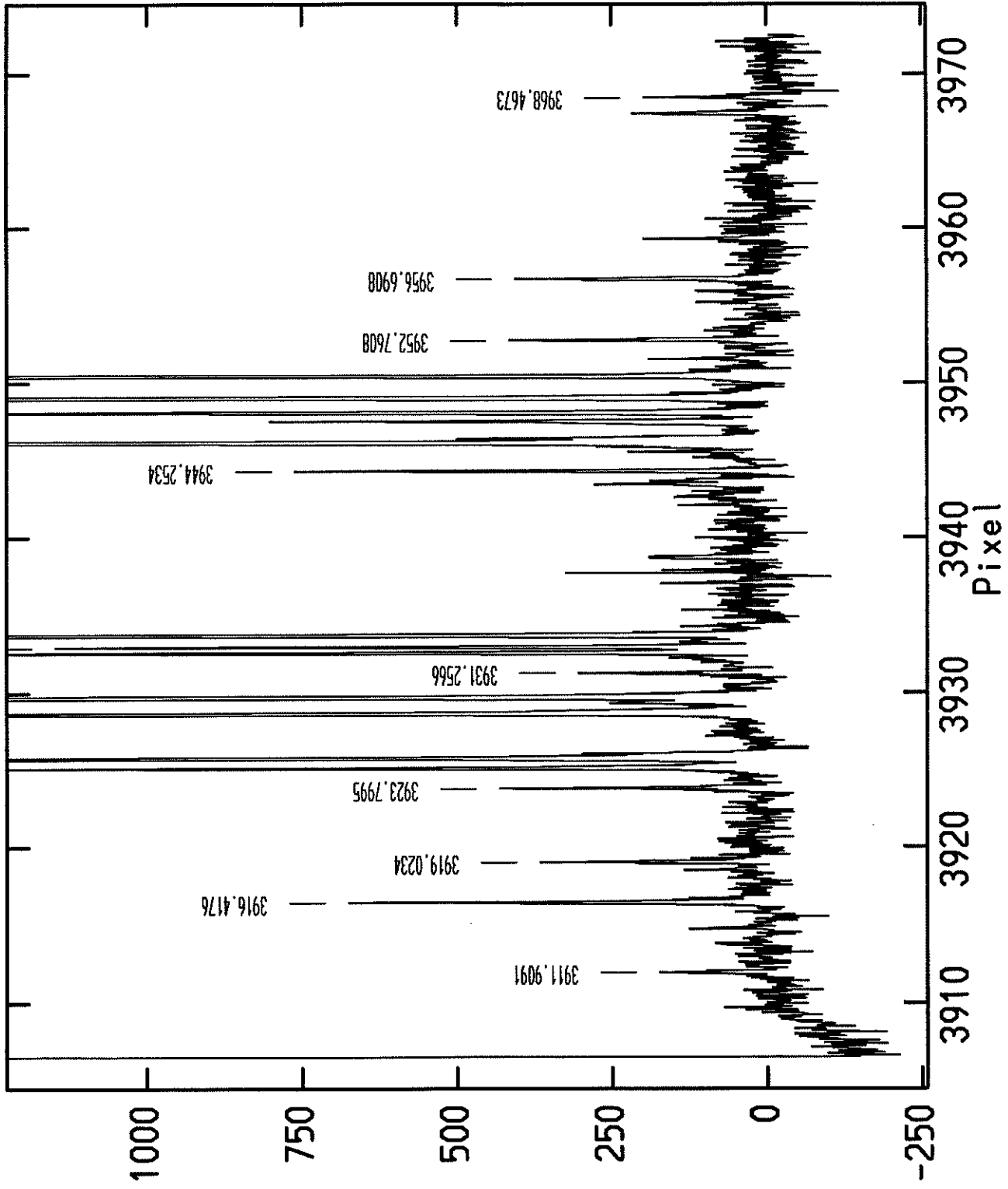
NOAO/IRAF V2.10EXPORT ~~sd~~serverdi.ucsc.edu Mon 14:39:17 09-May-94
Aperture 89 Image Line 89 Order 143
identify thar0066.r: th/ar



NDAO/IRAF V2.10EXPORT @ds@verdi.ucsc.edu Mon 14:32:10 09-May-94
Aperture 90 Image Line: 00 Order 144
identify char 0066.f: th/ar



NOAO/IRAF V2.10EXPORT ~~pdseverdi~~.UCSC.EDU Mon 14:33:39 09-May-94
Aperture of image line 91. Order 145
identify thar0066.r: th/ar



NOAO/IRAF V2.10EXPORT @gs@verdi.ucsc.edu Mon 14:34:34 09-May-94
Aperture 92 Image Line 92 Order 146
identify thar0066.r: th/ar

