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## Why do the HRC–S threads filter out the final PHA channel (e.g. "pha=0:254")?

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PHA has 256 channels (0 to 255). Filtering PHA 0:254 (i.e. removing channel 255) is a quick way to remove a fair amount of HRC–S background. Roughly 30% of background events and ~0% of x–ray events have PHA=255. You can safely remove PHA=0, too, but the improvement is negligible. See the [HRC–S Degap Correction thread](#) for an example of this filtering.

For grating data, better results are obtained when using the LETG/HRC–S "light" background filter, as described in the [Apply background filter section](#) of the [Obtain Grating Spectra from LETG/HRC–S Data thread](#). This uses a PHA filter (actually, a PI filter) centered on the expected mean PI value as a function of LETG/HRC–S dispersed wavelength. A tighter filter can therefore be used. This not only removes a larger fraction of the background, it does so more uniformly than simply removing pha=255 (which is not adjusted for local gain variations, as PI is). This may be important when doing spectral background subtractions.

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