



HRC-S QE and QEU

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Summary

HRC-S QE version 7 (`hrccd1999-07-22qeN0007.fits`) and QEU version 4 (`hrccd1999-07-22qeuN0004.fits`) are available as of [CALDB 3.0.1](#) (10 February 2005). We recommend that LETG/HRC-S grating ARFs be built with the CIAO tools, which by default use these new files, rather than using workarounds with canned grating ARFs. The [Compute LETG/HRC-S Grating ARFs thread](#) has more information on creating gARFs.

The November 2004 update to the LETG/HRC-S effective areas has precipitated new quantum efficiencies for the HRC-S detector. The upgrades were derived from observations of cosmic sources, and are described in the 2004 Chandra Calibration Workshop presentation "[Improvements to the HRC-S QE uniformity and LETGS effective area.](#)"

The new QE and QEU, when used in CIAO (by the `mkgarf` and `mkexpmap` tools) give a better estimate of the calibrated effective areas for LETGS than the previous QE (v6) and QEU (v3). Whereas the previous datasets produced deviations at the order $> \sim 6\%$ from the calibrated LETGS first order effective areas, the new set are globally within 5% of the calibration, and mostly within 3% thereof. `mkgarf` also locates the chip gaps properly for specific observations, taking the source position into account. In addition, the new QE and QEU will produce GARFs in CIAO that are consistent with the information in the CYCLE 07 proposal planning files, as well as the inputs to PIMMS for CY07.

Hence, with this release, we now recommend that LETG/HRC-S grating ARFs be built using CIAO tools, rather than using workarounds with canned grating ARFs. The canned GARFs for LETGS are no longer distributed with the CalDB as of version 3.0.0. While there are canned GARFs included on the CalDB proposal planning pages, we do not recommend these be used for analysis any longer. The [Compute LETG/HRC-S Grating ARFs thread](#) has more information on creating gARFs.

See the HRC-S calibration web pages for more information on the QE and QEU:

- [HRC MCP Quantum Efficiency](#)
- [HRC-S QE Uniformity Map](#)
- [HRC On-Axis Effective Area](#)

