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Correction of Detector Nonlinearity of the Airborne Research Interferometer Evaluation System (ARIES) with a low Temperature Blackbody

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The nonlinearity of a mercury cadmium telluride (MCT) photoconductive detector, of the Airborne Research Interferometer Evaluation System (ARIES), has been analysed and evaluated against a number of correction schemes. A high quality blackbody with accurate temperature control has been used as a stable and well-characterised radiation source. The detector nonlinearity was established as a function of scene temperature between 194 and 263 K. Second- and third-order corrections to the measured interferogram have been tested, by analysing the measured signal both within and outside the spectral response region of the detector. A combined correction scheme has been proposed which best represents the real nonlinear response of the detector.