Calibration Requirements for CanariCam on the Spanish GTC

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We examine the needs for infrared calibration with the new generation of 8-10 metre class telescopes, in particular the 10-m Gran Telescopio Canarias (GTC) which will enter operation in the Roque de los Muchachos Observatory, La Palma, Canary Islands in late 2003. Although our study is focussed towards mid-infrared calibration and, in particular, its mid-infrared Day 1 instrument denominated CanariCam, it is also applicable to the near infrared. The state of infrared calibration is briefly examined, along with the problems of the currently available lists of calibrators. We demonstrate that the current calibration lists, particularly in the mid-infrared are inadequate for reliable calibration of GTC observations and, by extension, observations with other telescopes of a similar diameter. Apart from a low density of stars on the sky, the majority of calibrators for 10 microns are almost 7 orders of magnitude brighter than the sources to be calibrated; we show why both of these factors may cause severe difficulties with data reduction if not remedied. Similarly, a major effort is required to provide suitable polarimetric standard stars for efficient use of CanariCam in its polarimetric mode. We discuss the difficulties and possible solutions involved.