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An Infrared Camera Reduction/Analysis Package

S. J. Chan
Institute of Astronomy, University of Cambridge, Madingley Road, Cambridge, CB3 0HA, United Kingdom

Abstract. An infrared-array reduction and analysis package which is written in the IRAF environment has been developed to handle the huge amount of data obtained at the Teide Observatory using the 1.5 m Carlos Sánchez Telescope with the new infrared Camera/Instituto de Astrofísica de Canarias(IRCAM/IAC). This is one of the near-infrared observational projects of the author. Several tasks are being developed which are written in CL or SPP in the IRAF environment for efficiently reducing and analyzing near-infrared data.

1. Introduction

Several barred spiral galaxies and galactic H II regions associated with small molecular clouds were observed with the IR-Camera on the 1.5 m Carlos Sánchez Telescope (CST) on the Teide Observatory during October 1996. This project is one of the near-infrared observation projects of the author.

2. IRCAM Package

2.1. IRCAM/IAC

The IRCAM/IAC is based on a 256×256 NICMOS 3 array and has a plate scale of 0.4″/pixel. Currently, the camera contains 7 filters covering the wavelength range from 1.2 μm to 2.32 μm. The 3 σ 60 seconds limiting magnitudes for point sources were 18.8 mag at J, 18.5 mag at H, and 16 mag at K.

2.2. General Description of the IRCAM package

The IRCAM/analysis package (Chan & Mampaso 1997) has been expanded into a large package for reducing and analyzing infrared data. Currently, there are 3 packages which are for reduction (IRCREDUCT), analysis (IRCPHOT) and for general usage and file handling (IRCUTIL). One of the advantages of this package is that it can easily handle the large amount of data. Furthermore, after the data were processed by tasks in IRCREDUCT, the side-effects due to problems from the CST (guiding problems for high declination objects) and from the IRCAM/IAC (the "drip noise" produced by the camera; see Figure 1a in Chan & Mampaso 1997)are reduced dramatically. The most important improvements are that the point spread function of stars becomes well-defined and the resolution of the images is improved (Figure 1 and Figure 2) The package

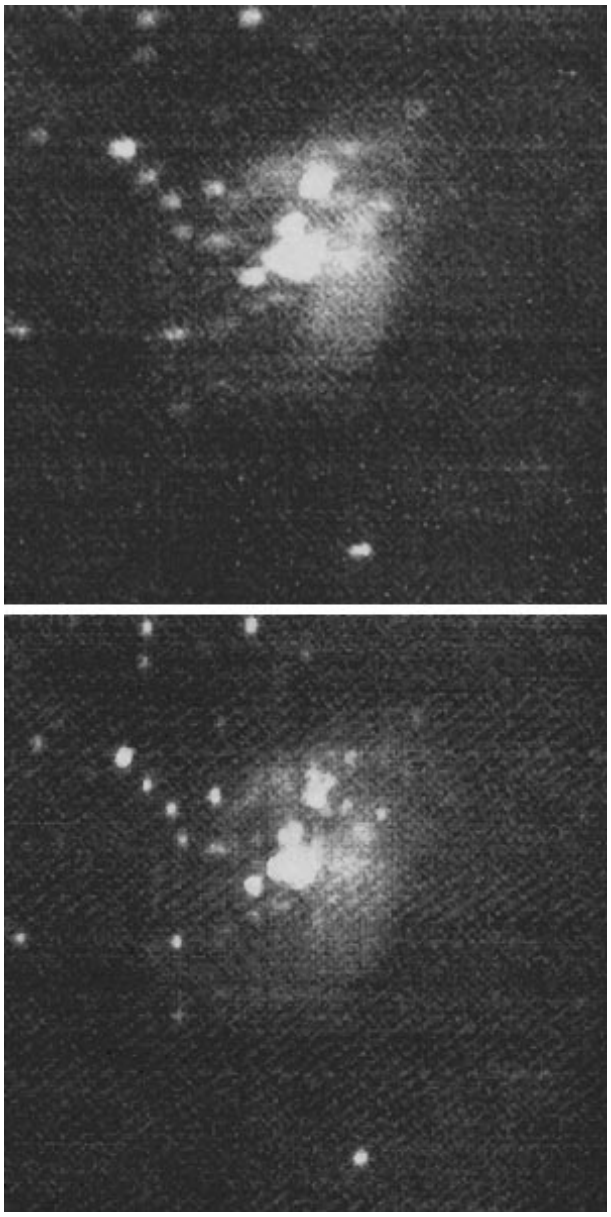

Figure 1. H band images of the H II region S152. In the top figure, the side-effect has not been corrected. In the bottom figure, the side-effect has been corrected and the PSF of stars becomes well-defined.

is now working well. IRCUTIL and IRCREDUCT which have been released to users in the IAC, also have full help utilities.

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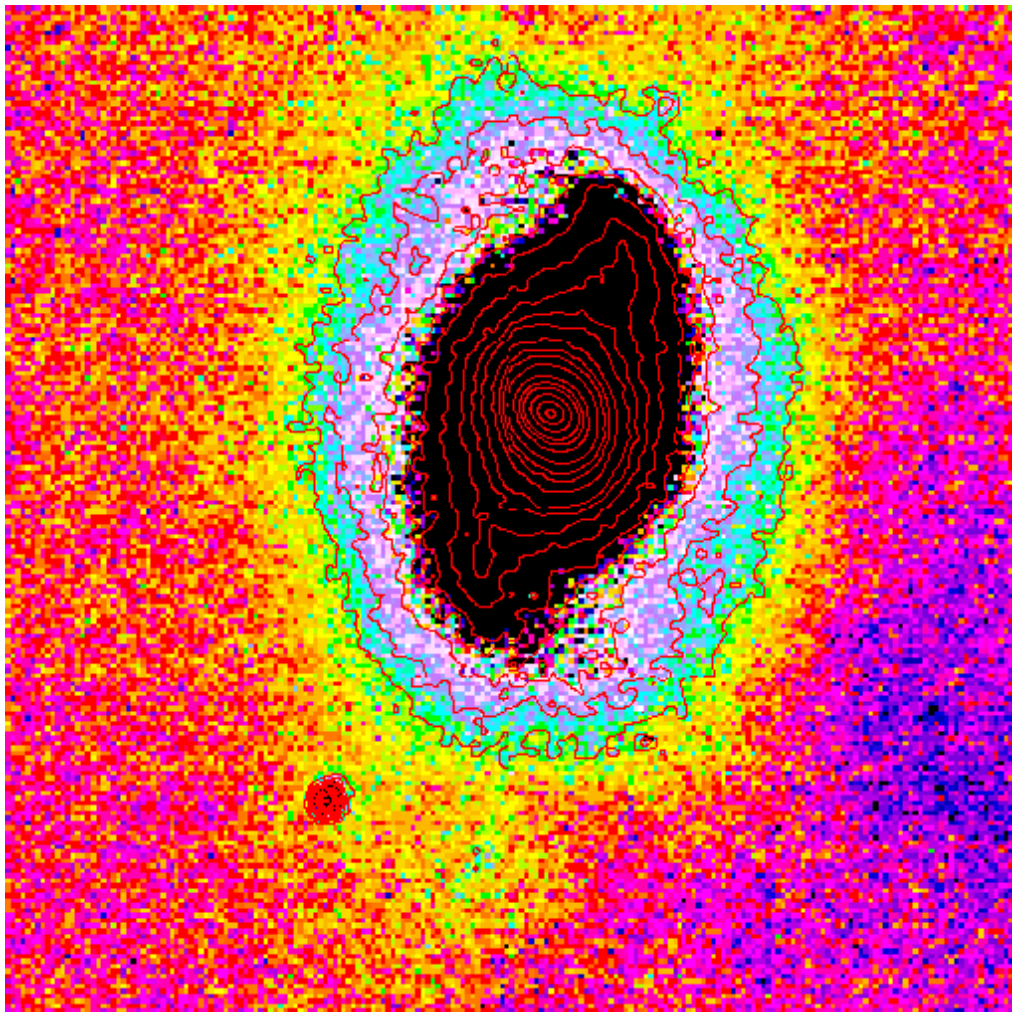

Figure 2. J band image of NGC2273. It is of good enough quality to allow ready detection of the inner bar. The "*effective*" resolution in working mode of the CST can now be better than the 1 ″ limit after image processing using the IRCAM package.

References

Chan, S. J., & Mampaso, A. 1997, in ASP Conf. Ser., Vol. 125, Astronomical Data Analysis Software and Systems VI, ed. Gareth Hunt & H. E. Payne (San Francisco: ASP), 93