

[Room/Salle : Campaign B]

Chair: T. Landecker, NRC

WE-A19-1 11h45

Crossing The Disciplines: Using Medical Imaging Software For Doing Astronomical Image Analysis, **Ian Cameron** and J.L. West, *University of Manitoba* — Though differing in approach, both astronomical and medical image analysis share many common techniques and challenges. Having had experience using the ImageJ program from NIH for CCD camera control and image acquisition, we feel it is worthwhile to further explore the feasibility of using medical imaging software for doing astronomy, and in the process benefiting from new approaches for doing some common astronomical image processing tasks. We present a comparison of the standard astronomical image processing package, IRAF, with the freely available medical image processing package, ImageJ. We compare the image analysis and visualization capabilities as well as the quantitative results produced from these software packages.

WE-A19-2 12h00

Smear Fitting: A New Deconvolution Method For Interferometry, **Rob Reid**, *DRAO/HIA/NRC* — Interferometers measure the Fourier transform of the image plane, but rarely can a good image be obtained simply by computing the FFT of the measurements, because the measurements are typically an incomplete sample. De-convolution techniques work by incorporating additional constraints, such as locality or smoothness in the final image. Smear fitting is a new de-convolution method that makes its constraints double as a model, with uncertainties, of the source. In fact it can be viewed as a tool for easily, or even automatically, producing and fitting a model for a source. I propose that such model-based constraints are not only more scientifically useful than the ones used in traditional de-convolution methods, but also more appropriate for imaging. An additional benefit of smear fitting is that it typically achieves much sharper (reliable) resolution than CLEAN, while simultaneously avoiding the most serious problems that can arise with CLEAN or traditional maximum entropy or model fitting de-convolution. I will show some examples from radio astronomy, and explain why the famous Rayleigh criterion (resolution = wavelength / baseline) is inappropriate for interferometers.

* This work is being supported by University of Toronto, NRC, and NSERC.

WE-A19-3 12h15

On Predicting the Polarization of Low-frequency Emission by Diffuse Interstellar Dust*, **Peter Martin**, *CITA, University of Toronto* — Several of the current and next-generation cosmic microwave background (CMB) experiments have polarimetric capability (including the Planck Surveyor for which Canadian participation is funded by the CSA), promising to add to the finesse of precision cosmology. One of the contaminating Galactic foregrounds is thermal emission by dust. Since optical interstellar polarization is commonly seen, from differential extinction by aligned aspherical dust particles, it seems likely that the thermal emission will be polarized. Indeed, in the Galactic plane and in dark (molecular) clouds, dust emission in the infrared and submillimetre has been measured to be polarized. It seems likely that the faint diffuse cirrus emission, of more interest (and nuisance) to CMB experiments, will be polarized too. We discuss how well the amount of polarization of this component can be predicted, making use of what is known about optical (and infrared and ultraviolet) interstellar polarization. Some constraints on anomalous microwave emission from spinning dust can be made through polarimetry as well.

* This work is being supported by NSERC and CSA.

12h30 Session Ends / Fin de la session