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Multiwavelength Magnetic Field Modeling

T. R. Jaffe
Université de Toulouse & CNRS; UPS-OMP; IRAP; Toulouse, France
email: tess.jaffe@irap.omp.eu

Abstract. We model the large-scale Galactic magnetic fields, including a spiral arm compression to generate anisotropic turbulence, by comparing polarized synchrotron and thermal dust emission. Preliminary results show that in the outer Galaxy, the dust emission comes from regions where the fields are more ordered than average while the situation is reversed in the inner Galaxy. We will attempt in subsequent work to present a more complete picture of what the comparison of these observables tells us about the distribution of the components of the magnetized ISM and about the physics of spiral arm shocks and turbulence.

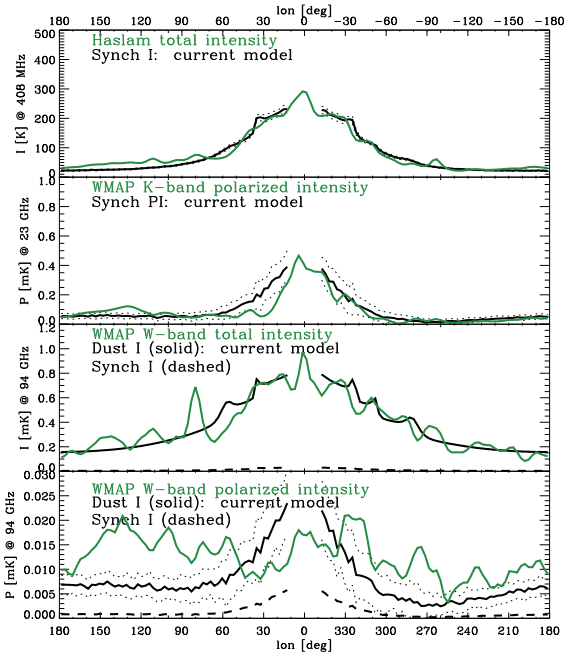

Figure 1. Observables *(lighter curves))* compared to model *(darker curves)* similar to Jaffe *et al.* (2010,2011), now adding polarized thermal dust emission (following Fauvet *et al.* 2011). From top to bottom: synchrotron total intensity at 408 MHz (Haslam *et al.* 1982); *WMAP* synchrotron polarized intensity at 23 GHz (Jarosik *et al.* 2011); thermal dust total intensity at 94 GHz (id.); thermal dust polarized intensity at 94 GHz (id.). From the underprediction of its polarization in the outer Galaxy, we infer that the dust emission is coming from regions where the fields are more ordered than average. By contrast, in the inner Galaxy near the Galactic center, the overprediction implies to the contrary that the dust emission is coming from regions that are less ordered than average.

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