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Magnetic field components analysis of the SCUPOL 850 microns polarization data catalog

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Abstract. The SCUPOL catalog is a compilation of 83 regions that were observed at the JCMT between 1997 and 2005. For sufficiently sampled maps, we conduct an analysis for characterizing the polarization and magneto-turbulent properties of the observed regions. The same analysis is done on 2D polarization maps produced by 3D MHD 1024 pixel grid simulations that have been scaled on a sample of observed maps. Each scaled MHD cube of simulated data is used to calculate the mean turbulent regime of each observed regions.

Keywords. ISM: magnetic fields, ISM: molecular clouds, polarimetry, submm, MHD: simulations

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We present an analysis of the SCUPOL catalog produced by Matthews *et al.* (2009).

For sufficiently sampled maps of star-forming regions, inferred parameters (<p>, γ, b) are estimated to characterize the polarization properties, the depolarization properties and the turbulent-to-mean magnetic field ratio of each region as seen on the plane-of-sky. Statistical studies show no specific correlation of each parameters with each other suggesting that they provide information of different nature about the region considered, at least at the 14″ resolution of the observations. Similar set of parameters are calculated from 2D polarization maps produced with 3D MHD 1024 pixel grid simulations (see Falceta-Gonçalves *et al.* (2008)) performed for different MHD regimes. Such MHD regimes have been estimated for 4 regions with 3D MHD cubes properly scaled on the observed maps. Our results shown in Tab. 1 and those obtained by Crutcher (1999)'s analysis of Zeeman Measurements toward subregions of the clouds are consistent within a factor 2.

Table 1. Description of the simulations - MHD, 1024^3.

Model	$M_S^{(a)}$	$M_A^{(b)}$	Object Name
1.....	2.0	0.3	S106
2.....	3.0	0.5	OMC-2/3
3.....	5.0	0.7	W49
4.....	5.0	0.7	DR21

Notes: [a] Sonic Mach Number. [b] Alfvénic Mach Number.

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