

Dust and polarization of cold clumps

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Abstract. The Planck catalogue of Galactic cold clumps, PGCC, contains sources of ongoing and future star formation. The data show clear variations also in their dust properties.

We use Planck polarization measurements to investigate the polarization fraction in PGCC clumps and the relative orientation of filamentary structures and magnetic fields (Alina *et al.* 2017). The decrease of polarization fraction as a function of column density can be related to the field geometry but also suggest some loss of grain alignment.

PGCCs have been studied with ground-based observations (Liu *et al.* 2018). The first SCUBA-2/POL-2 polarization studies have targeted the infrared dark cloud G35.39-0.33. The magnetic field is found to be mostly perpendicular to the main filament. The plane-of-the-sky field strength is $\sim 50 \mu\text{G}$, a noticeable support against gravity. The polarization fraction decreases with increasing column density. This matches predictions of RAT grain alignment models but the relative contribution of the field morphology is hard to quantify (Juvela *et al.* 2018).

We continue to use MHD simulations to study the same phenomena, with synthetic observations of clumps and filaments.

References

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