

DUST POLARIZATION IN PROTOPLANETARY DISKS: EVIDENCE FOR MULTIPLE MECHANISMS AT WORK

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The surfaces of astronomical dust grains are a crucial site for chemical reactions. Observations of polarized emission from dust grains provide a powerful tool for investigating the sizes and distribution of dust grains in protoplanetary disks. We present ALMA observations of three protostellar disks at 3 mm and 870 μm : Haro 6-13, RY Tau, and MWC 480. At 870 μm , all three disks show polarization morphologies consistent with those produced by self-scattering. At 3 mm, Haro 6-13 shows a polarization morphology that may indicate radiative or mechanical alignment of grains, while RY Tau and MWC 480 still show polarization patterns that are consistent with scattering. Additionally, we present models of the polarization patterns different polarization mechanisms would be expected to produce in these disks.