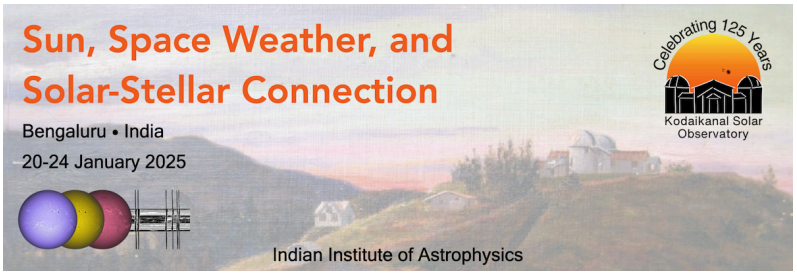

Contribution ID: **197** Type: **Poster**

Effect of Dynamo-Generated Large-Scale Magnetic Fields on the f Mode

In helioseismology, traditional analytical models often neglect the effects of rotation and magnetic fields, limiting their applicability. However, observations frequently reveal instances where these elements are critical. Previous studies have investigated the influence of externally imposed magnetic fields on seismic modes using idealized 2D MHD simulations. Here, we extend this work by performing 3D MHD simulations using the Pencil Code to examine the impact of self-sustained, dynamo-generated magnetic fields on seismic modes, particularly the f-mode. Our simulations incorporate naturally excited dynamo action, allowing us to avoid externally imposed uniform or nonuniform magnetic fields. Preliminary results indicate that when the dynamo reaches saturation—transitioning from the kinematic to the saturated phase—the mode mass of the f-mode increases, suggesting a strengthening of the f-mode. Additionally, we observe other established effects, including frequency shifts and the fanning of the f-mode, consistent with prior findings.

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Theme

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