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Impact of Electron Scattering Redistribution on Spectral Line Polarization Formed in Stellar Atmospheres

In a stellar atmosphere, the resonance line polarization arises from scattering of limb-darkened radiation field by atoms. This spectral line polarization is severely affected particularly in the wings, when the line photons suffer scattering on electrons in thermal motion. Electron scattering opacity is known to be significant in higher layers of sun and stars, especially the hotter stars. Scattering of line photons by atoms and electrons are, respectively, described by the atomic and electron scattering redistribution functions, which in general depend on both the frequencies and directions of incident and scattered photons. In this poster/ talk, I will present our recent work (Sampoorna et al. 2022, ApJ and Sampoorna & Supriya 2023, MNRAS) on the impact of electron scattering redistribution on resonance line polarization formed in a spherically symmetric extended and expanding atmosphere. We highlight the importance of including frequency and directional dependence of atomic and electron scattering redistribution on resonance line polarization.

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Theme

Solar - Stellar Connections

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