

DKIST resolves sub-arcsec photospheric scattering polarization

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The scattering polarization in the Sr I 4607 Å spectral line is a powerful diagnostic for probing microturbulent magnetic fields in the solar photosphere. However, measuring its spatial variations remains an observational challenge due to the weak polarization signals involved. In this talk, we present new high-resolution spectropolarimetric observations from ViSP@DKIST, capturing resolved scattering polarization maps in quiet Sun regions at various limb distances. Our observational approach enables the first direct identification of sub-arcsecond structures in the Sr I line’s linear polarization. Power spectrum analysis confirms an effective spatial resolution of 0.2, pushing the observational limits of solar scattering polarization. These results highlight the potential of DKIST in advancing our understanding of small-scale magnetic structures and the turbulent surface dynamo in the solar photosphere.