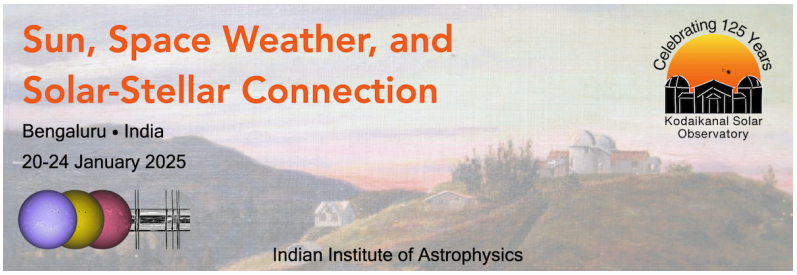

Contribution ID: **60** Type: **Poster**

Solar Cycle-to-Cycle Variations in the Coefficients of Joy's Law and Angular Momentum Transport Determined From Sunspot-Group Data: A Comparison

The tilts of bipolar magnetic regions are believed to be caused by the action of Coriolis force on rising magnetic flux tubes. Here we analysed the combined Greenwich and Debrecen observatories sunspot-group data during the period 1874-2017 and the tilt angles of sunspot groups measured at Mt. Wilson Observatory during the period 1917-1986 and Debrecen Observatory during the period 1994-2013. We find that there exists about 8-solar cycle (Gleissberg cycle) trend in the long-term variation of the slope of Joy's law (increase of tilt angle with latitude). There exists a reasonably significant correlation between the slope/coefficient of Joy's law and the slope (coefficient of the poleward/equatorward angular momentum transport) of the linear relationship between the rotation residuals and meridional motions of sunspot groups in the separate hemispheres during Solar Cycles 16-21. We also find that there exists a good correlation between north-south difference (asymmetry) in the coefficient of Joy's law and that in the coefficient of angular momentum transport. These results suggest that there exists a relationship between the surface/subsurface poleward/equatorward angular momentum transport and the Joy's law. There is a suggestion of the strength of the Joy's law depends on the strength of the poleward angular momentum transport.

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Theme

Solar Magnetism over Long-Time Scales

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