

## Sector Polarity of the Interplanetary Magnetic Field and Seasonal Variation in the Equatorial Magnetic Field

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Analysis of 17 years' horizontal intensity data at the equatorial station at Trivandrum establishes that two significant components constitute the seasonal variation in the field near the axis of the equatorial electrojet. One of these components is critically dependent on sector polarity of the interplanetary magnetic field (IMF) and is predominantly annual. At Trivandrum, this component is in phase with similar component at the low-latitude station, Alibag, outside the electrojet and its amplitude varies with local time (LT) by a factor which is about two. The other component, which is essentially independent of the sector polarity, has an amplitude which varies with LT by a very large factor and is maximum around 10 and 11 hr LT. In the forenoon hours, this component is out of phase with similar component at Alibag. During local nights, however, the seasonal variations of this component at the two stations are practically similar. With the advantage of a very high signal-to-noise ratio in the semi-annual signal at 10–11 hr at Trivandrum and 8–9 hr at Alibag, the two components have also been computed at these hours as a function of the degree of magnetic disturbance. It is shown that for the entire range of

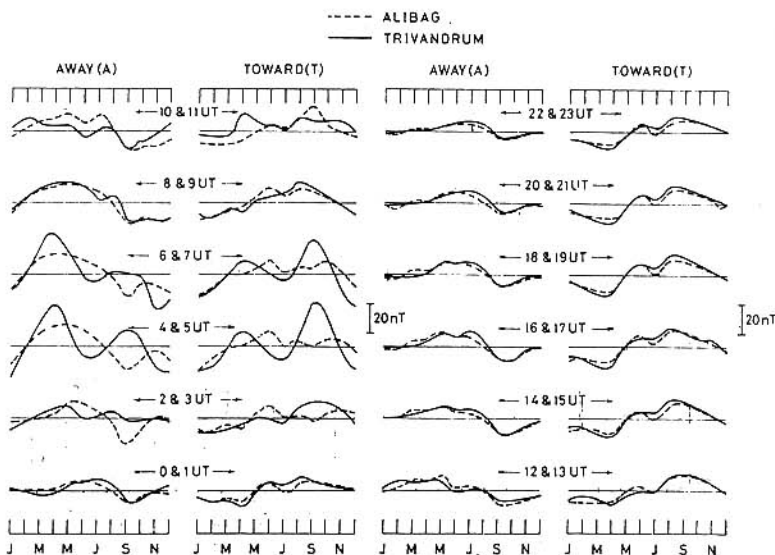


Fig. 1. Seasonal variation in horizontal intensity at Trivandrum and Alibag for 'away' and 'toward' polarity of IMF for consecutive pairs of universal time (UT) hours.

magnetic activity, the seasonal variation of the polarity-dependent component is identical whereas, the variations of the polarity-independent component occur in phase opposition at the two stations.

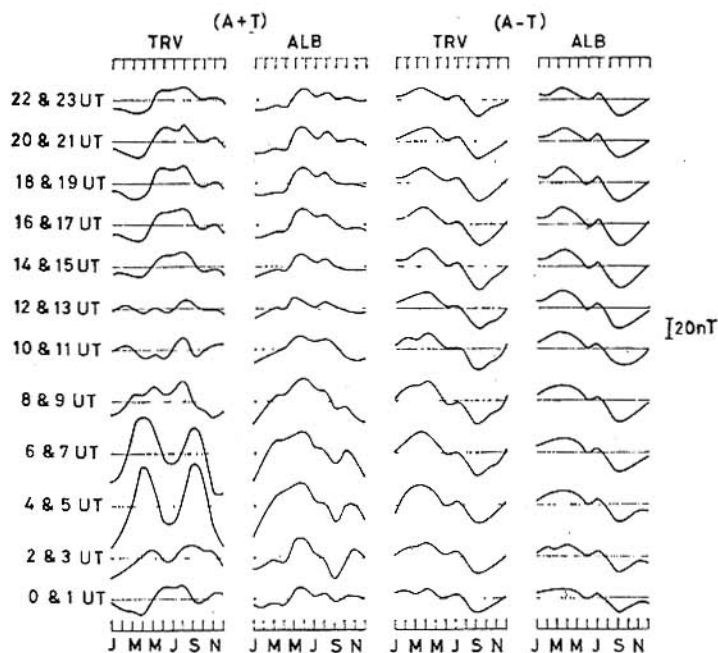


Fig. 2. Polarity-independent ( $A+T$ ) and polarity-dependent ( $A-T$ ) seasonal variations at Alibag and Trivandrum.

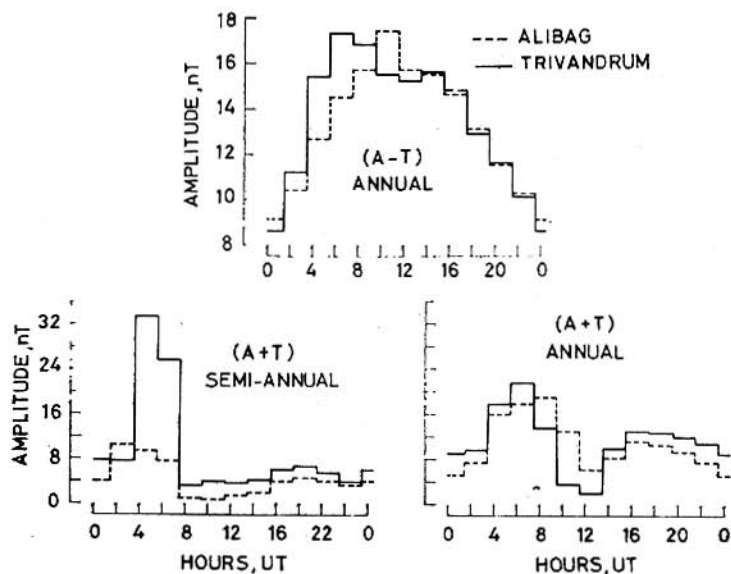


Fig. 3. Diurnal variation in the amplitude of the annual and semi-annual components of the seasonal variation at Trivandrum and Alibag.

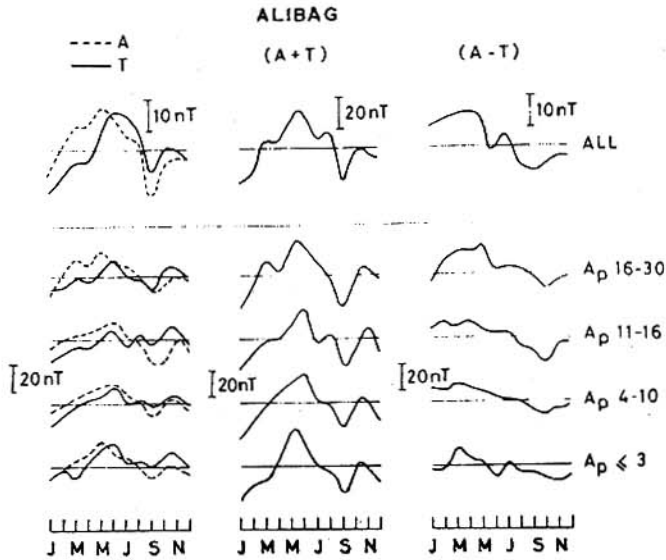


Fig. 4. Seasonal variation of the horizontal intensity at Alibag as a function of magnetic activity.

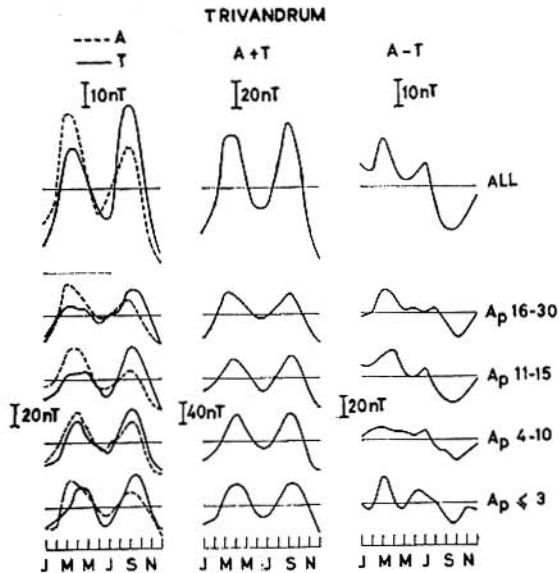


Fig. 5. Seasonal variation of the horizontal intensity at Trivandrum as a function of magnetic activity.