

Day-to-day variability of Equatorial Electrojet and its role on the day-to-day characteristics of Equatorial Ionization Anomaly over the Indian and Brazilian sectors

K.Venkatesh¹, P.R. Fagundes¹, D.S.V.V.D. Prasad², C. M. Denardini³

¹Universidade do Vale do Paraíba (UNIVAP), IP&D, Sao Jose dos Campos, SP, Brazil

²Department of Physics, Andhra University, Visakhapatnam, India

³Instituto Nacional de Pesquisas Espaciais (INPE), S.J. Campos, SP, Brazil



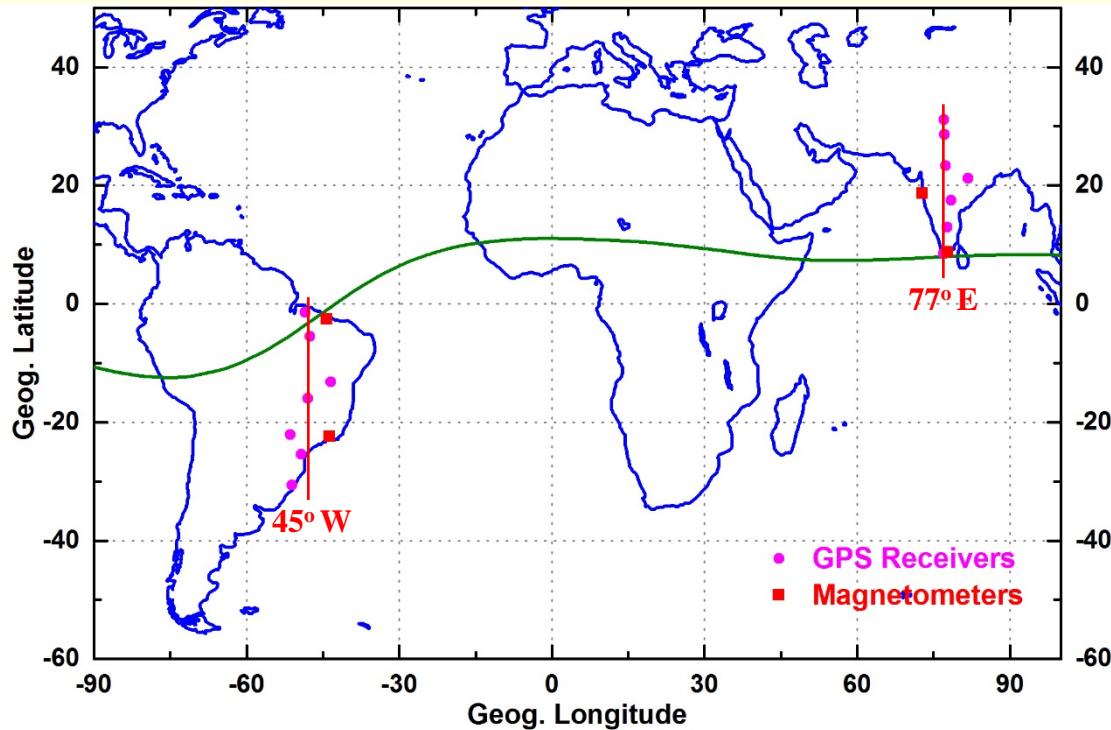
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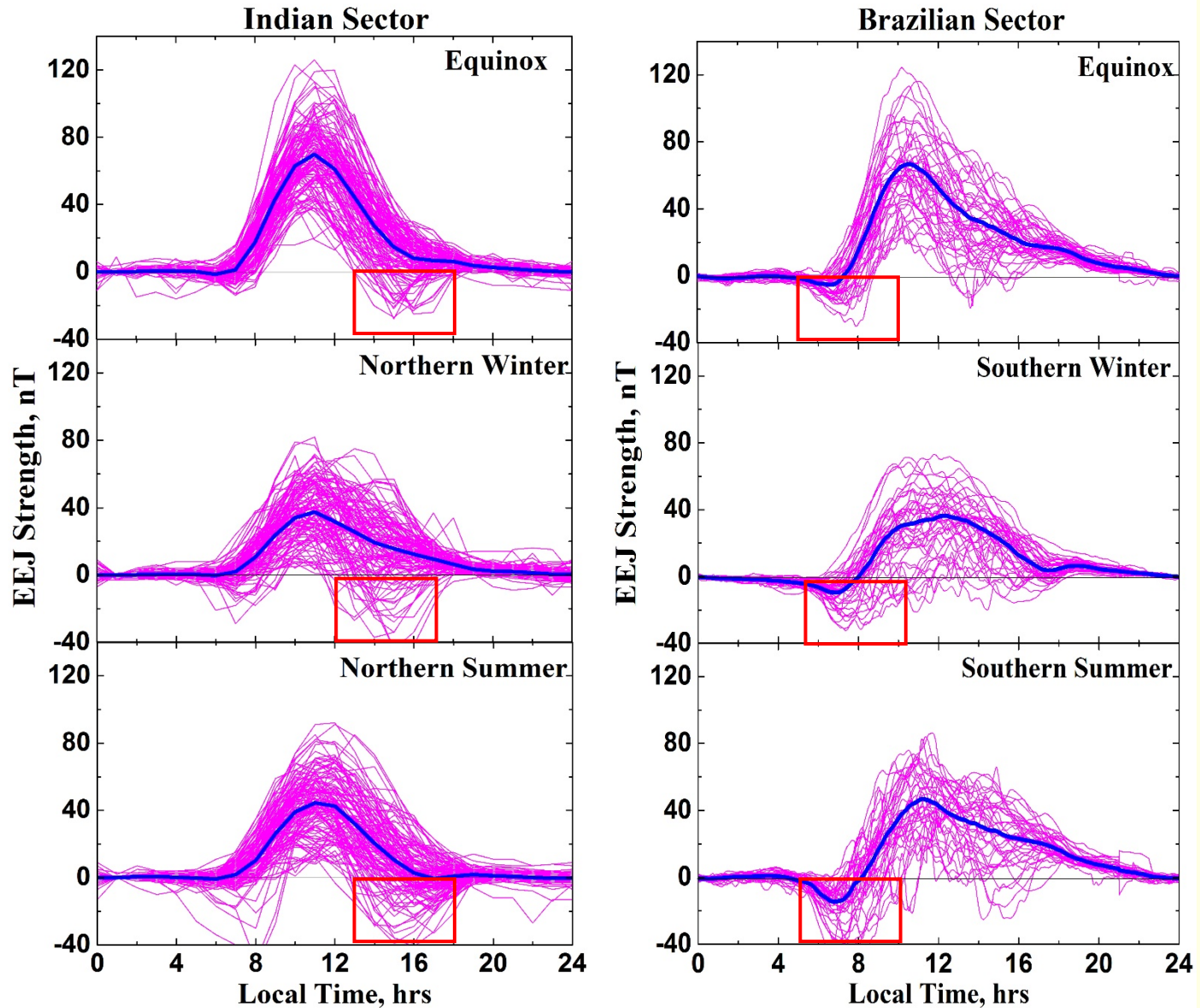
- ❖ Diurnal variations of EEJ in the Northern (India) and Southern (Brazilian) hemispheres
- ❖ Comparison of the occurrence characteristics of CEJ in the Indian and Brazilian sectors
- ❖ Seasonal and day-to-day characteristics of EEJ and TEC at the EIA trough and crests
- ❖ Strength of the EIA – its dependence with different EEJ parameters (EEJ_{daymax} , IEEJ and $IEEJ_{\text{daymax}}$)
- ❖ Absence of the well-developed EIA during morning CEJ events
- ❖ Time lag between the day maximum EEJ and well-developed EIA

GPS Receivers and Magnetometers in the Indian and Brazilian sectors

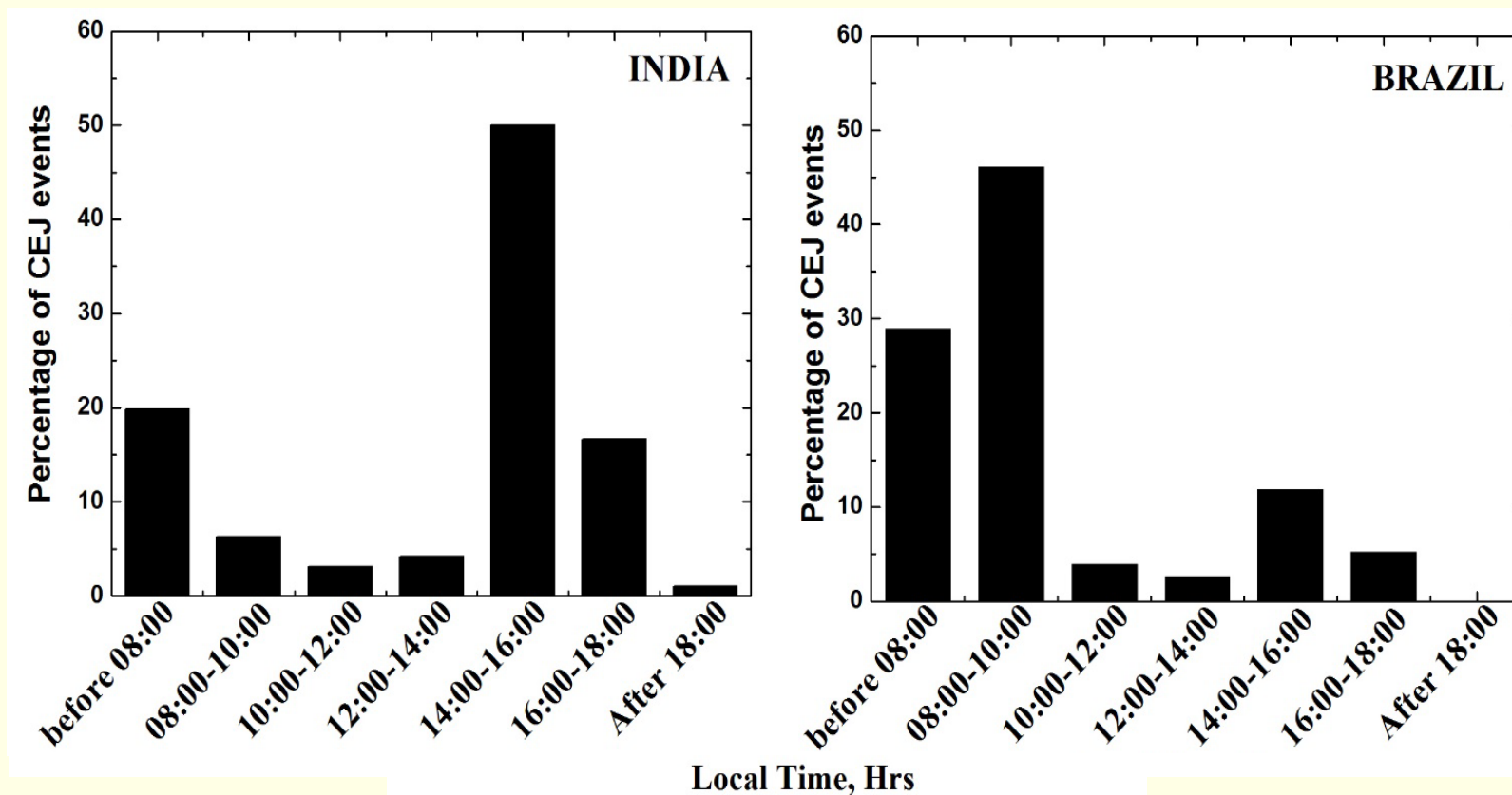


Station Name Code	Geog. Lat.	Geog. Lon.	Dip. Lat.
GPS Receivers in the Indian Sector			
Trivandrum (TRIV)	8.47 °N	76.91 °E	0.4 °N
Bangalore (BNGL)	12.9 °N	77.68 °E	6.0 °N
Hyderabad (HYDE)	17.4 °N	78.47 °E	11.4 °N
Raipur (RAIP)	21.2 °N	81.74 °E	15.8 °N
Bhopal (BHOP)	23.3 °N	77.34 °E	18.6 °N
Delhi (DELH)	28.6 °N	77.21 °E	25.1 °N
Shimla (SHIM)	31.1 °N	77.07 °E	28.2 °N
GPS Receivers in the Brazilian Sector			
Belem (BELE)	1.4 °S	48.45 °W	2.8 °N
Empress (IMPZ)	5.5 °S	47.48 °W	0.8 °S
BJD Lapa (BOMJ)	13.3 °S	43.41 °W	7.6 °S
Brazilia (BRAZ)	15.9 °S	47.9 °W	9.8 °S
P. Prudente (UEPP)	22.1 °S	51.4 °W	14.9 °S
Curitiba (PARA)	25.4 °S	49.21 °W	17.4 °S
P. Alegre (POAL)	30.6 °S	51.11 °W	21.2 °S
Magnetometers in the Indian Sector			
Tirunelveli (TNVL)	8.7 °N	77.8 °E	0.4 °N
Alibag (ALBG)	18.6 °N	72.8 °E	13.1 °N
Magnetometers in the Brazilian Sector			
Sao Luiz (SALU)	2.58 °S	44.2 °W	0.6 °S
Vassouras (VSSR)	22.4 °S	43.6 °W	15.3 °S

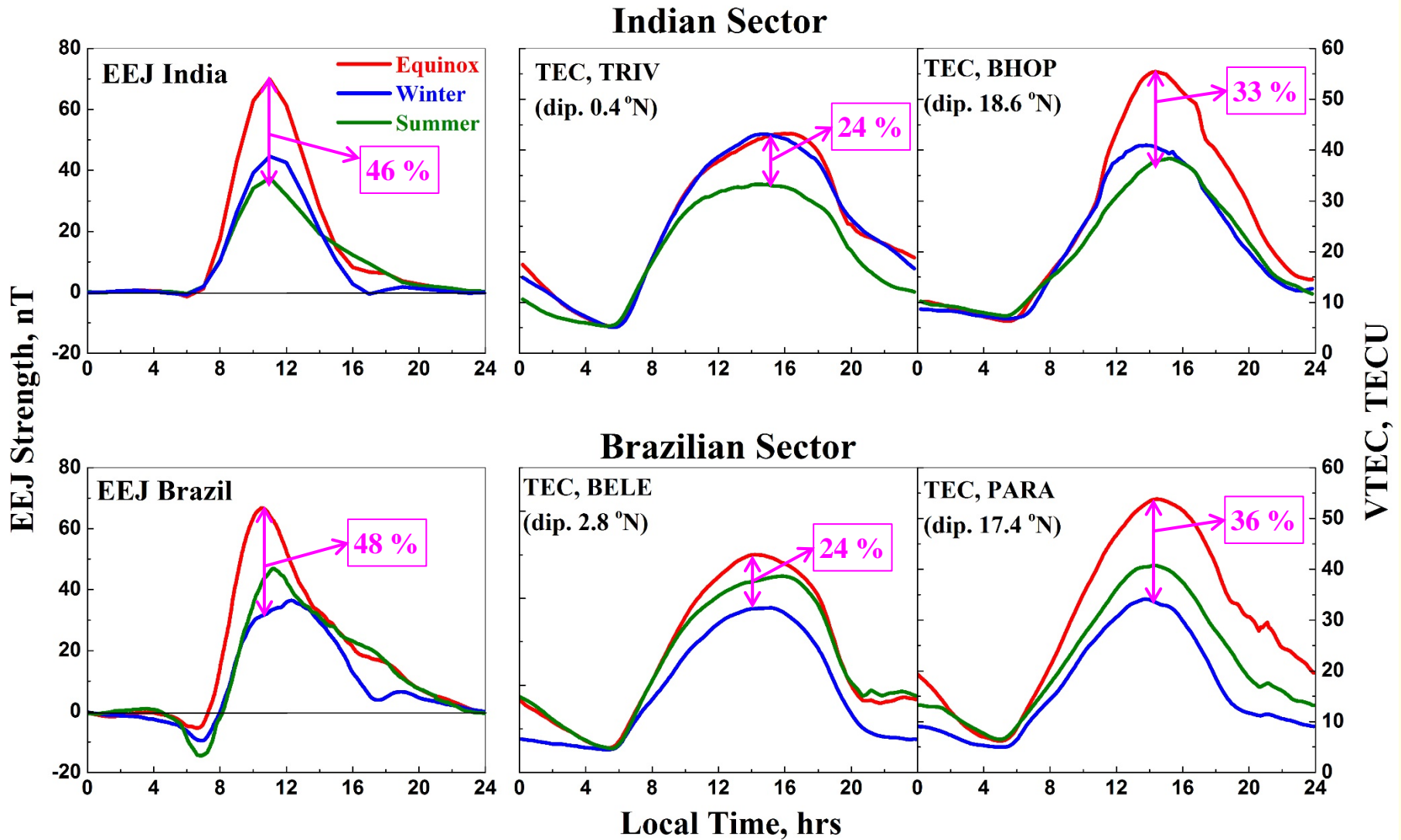
Diurnal and Hemispheric variations of EEJ



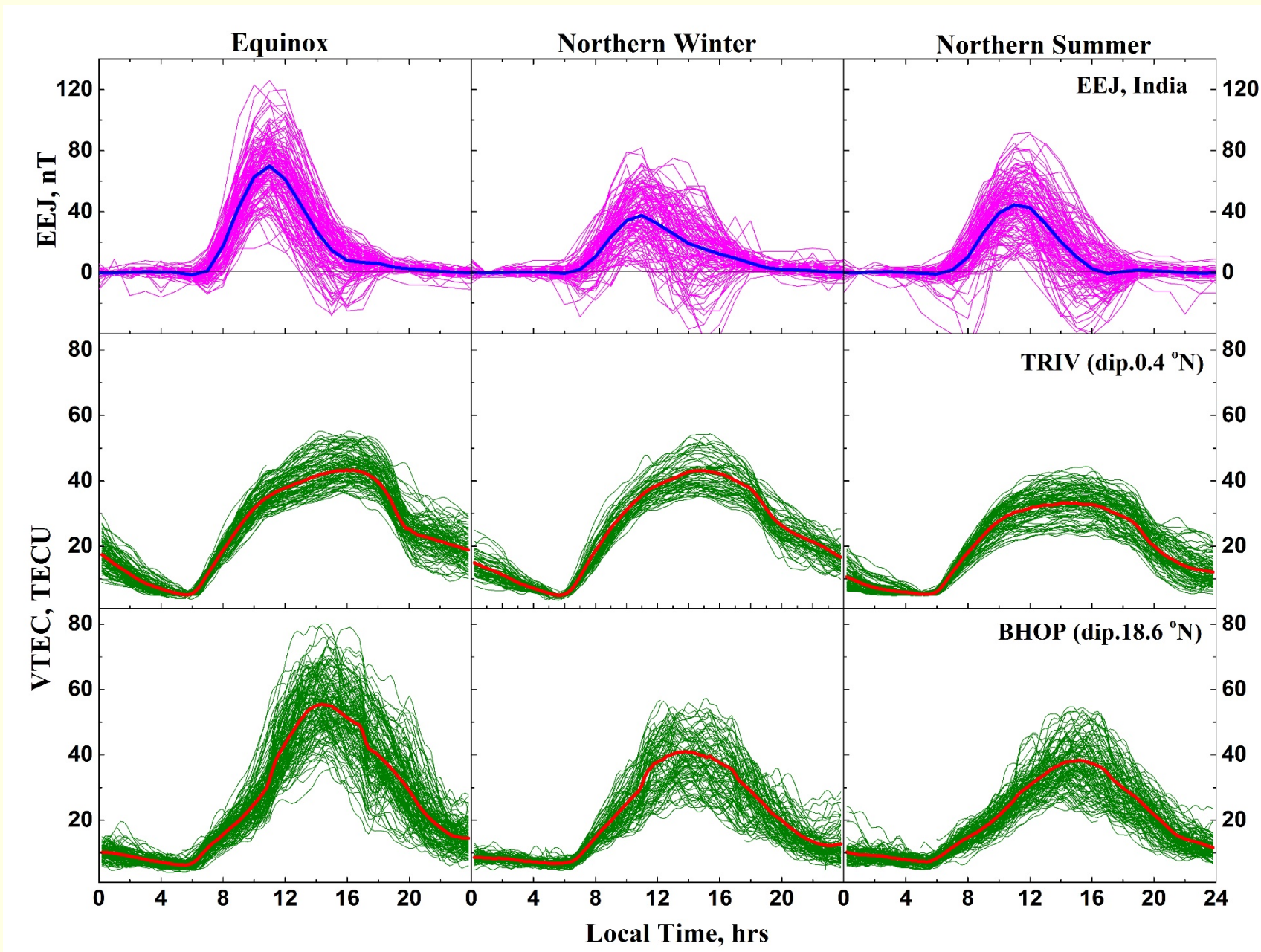
Occurrence characteristics of CEJ events in the Indian and Brazilian sectors



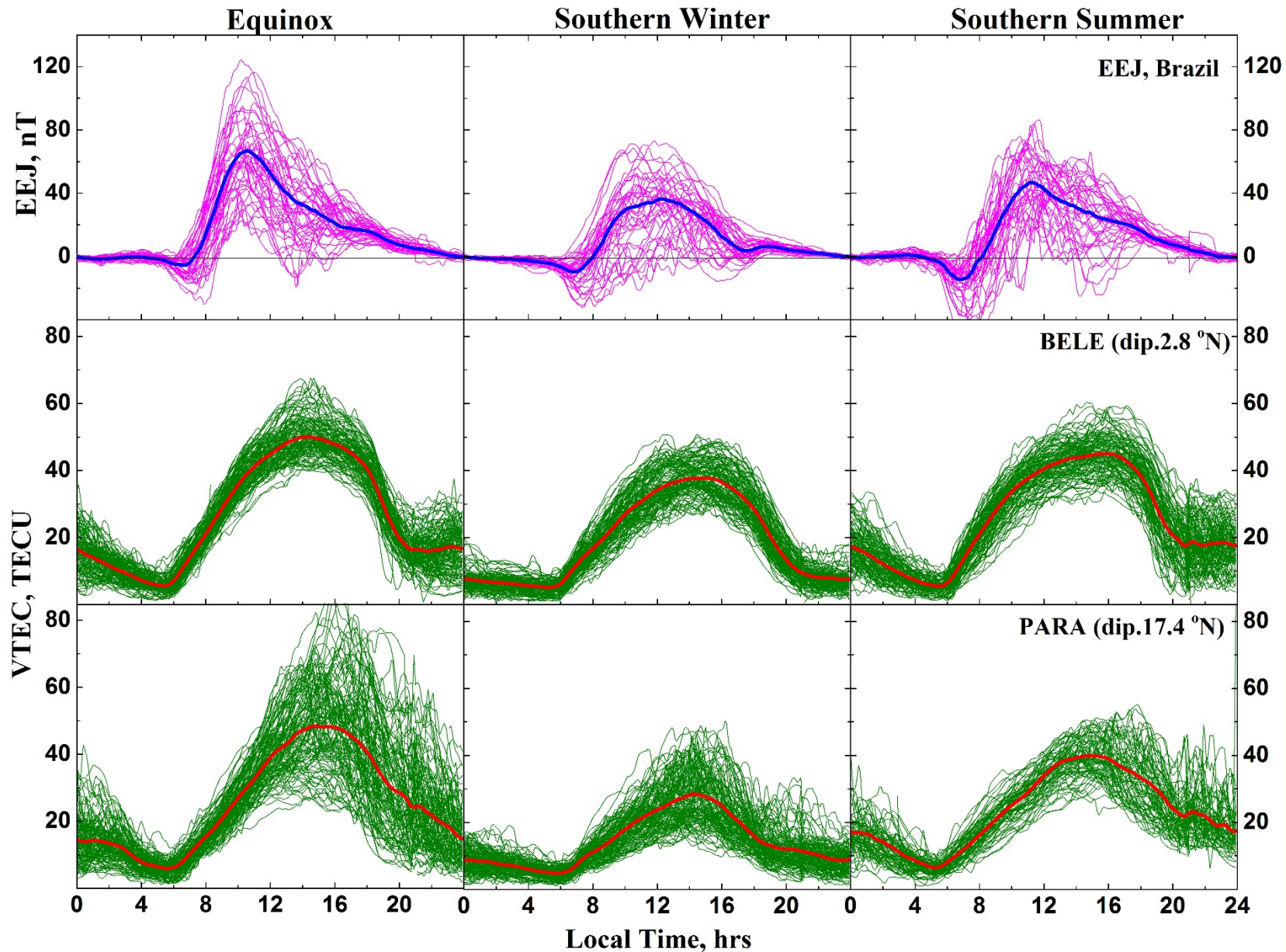
Seasonal mean characteristics of EEJ and TEC at EIA trough and crests



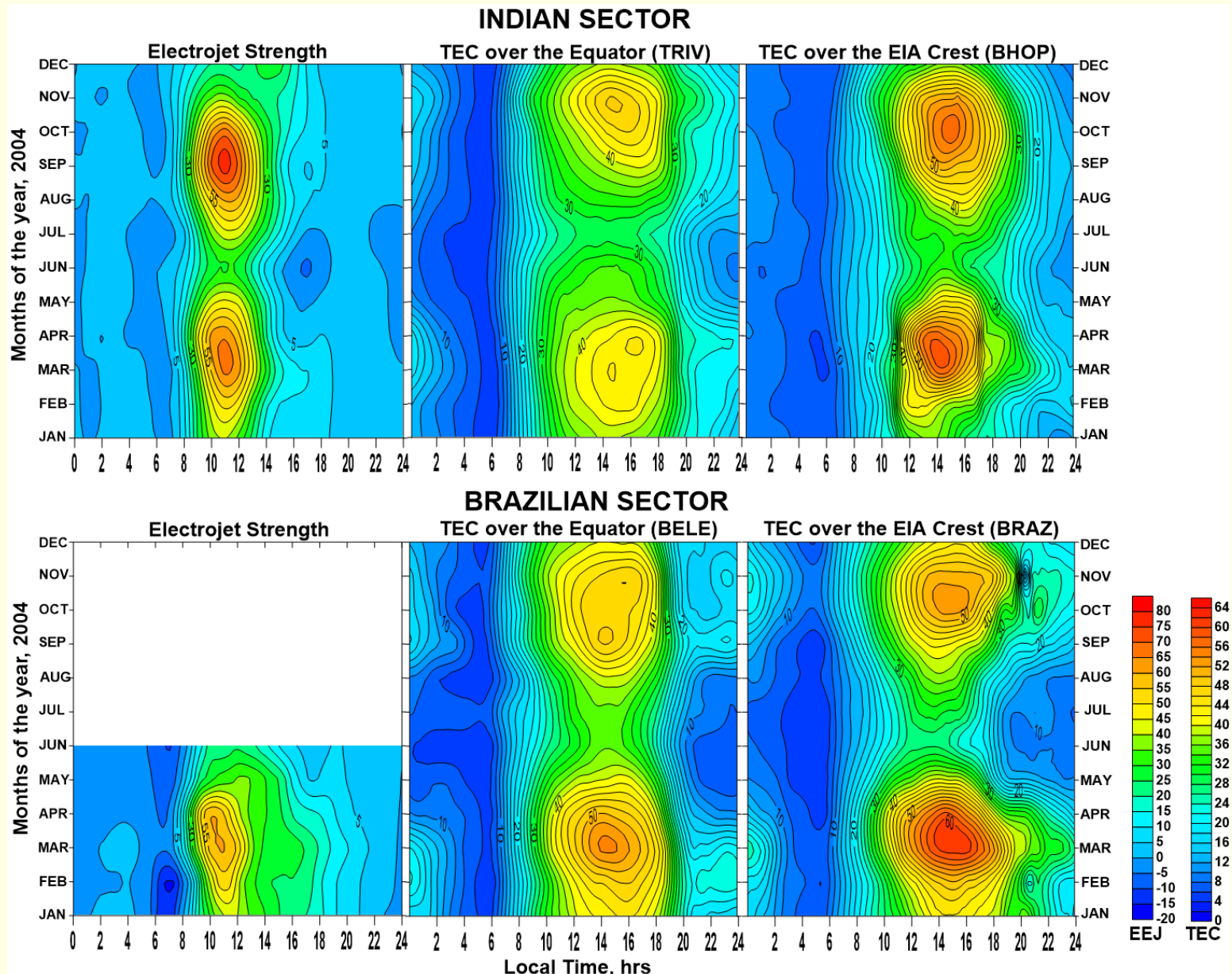
Day-to-day variability of EEJ and TEC at the EIA trough and crests



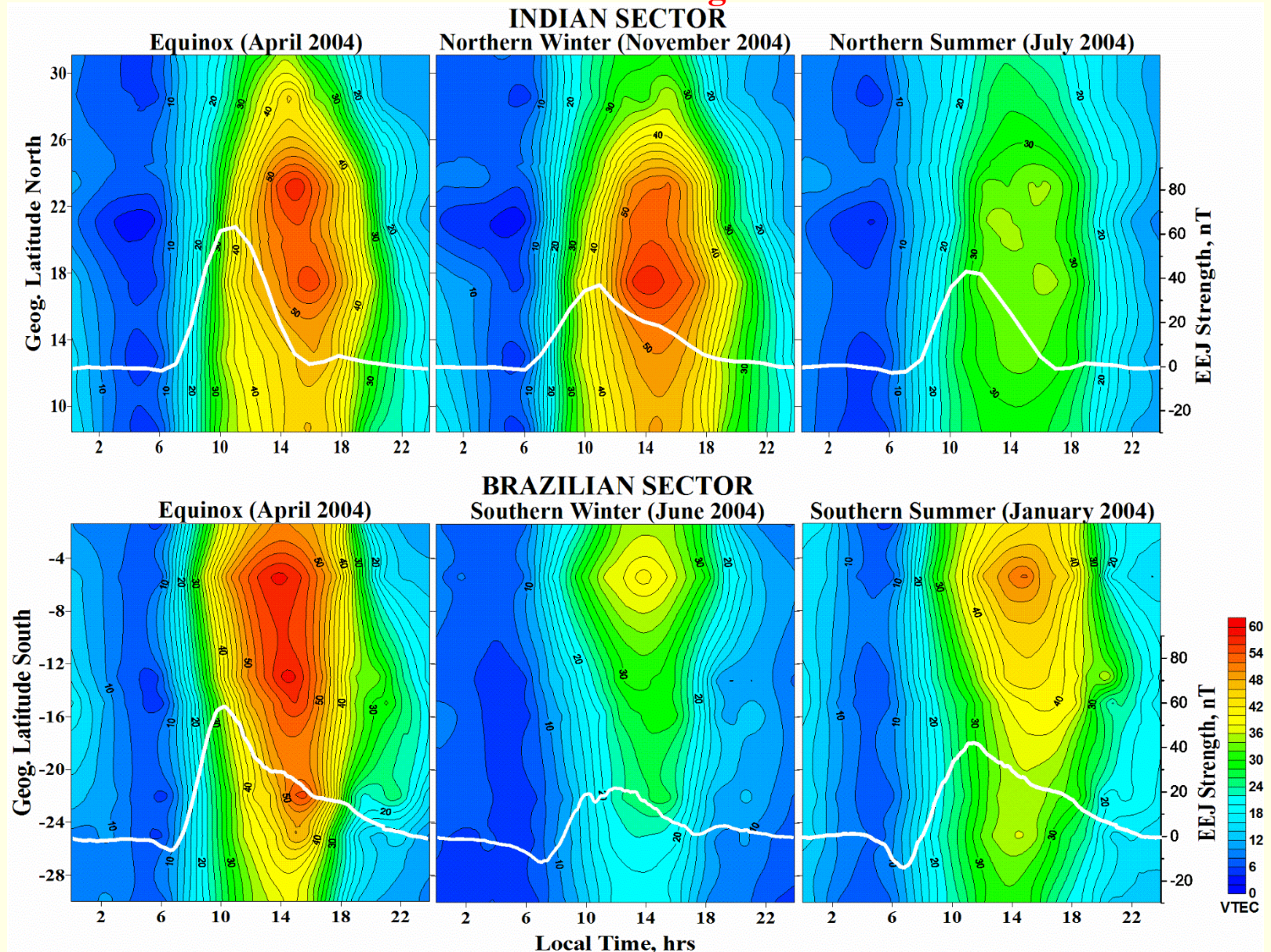
Day-to-day variability of EEJ and TEC at the EIA trough and crests

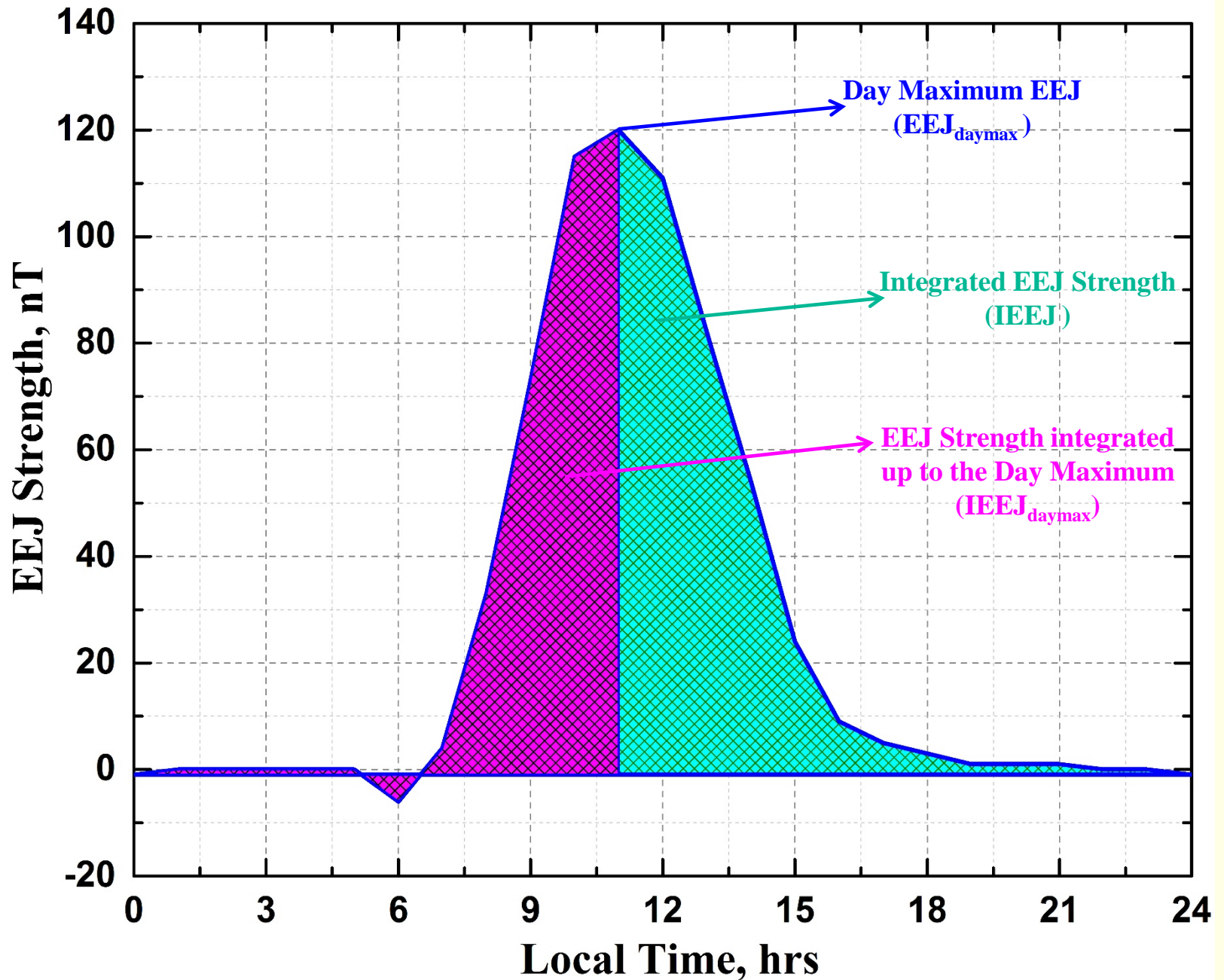


Semi annual variations of EEJ and TEC in the Indian and Brazilian sectors

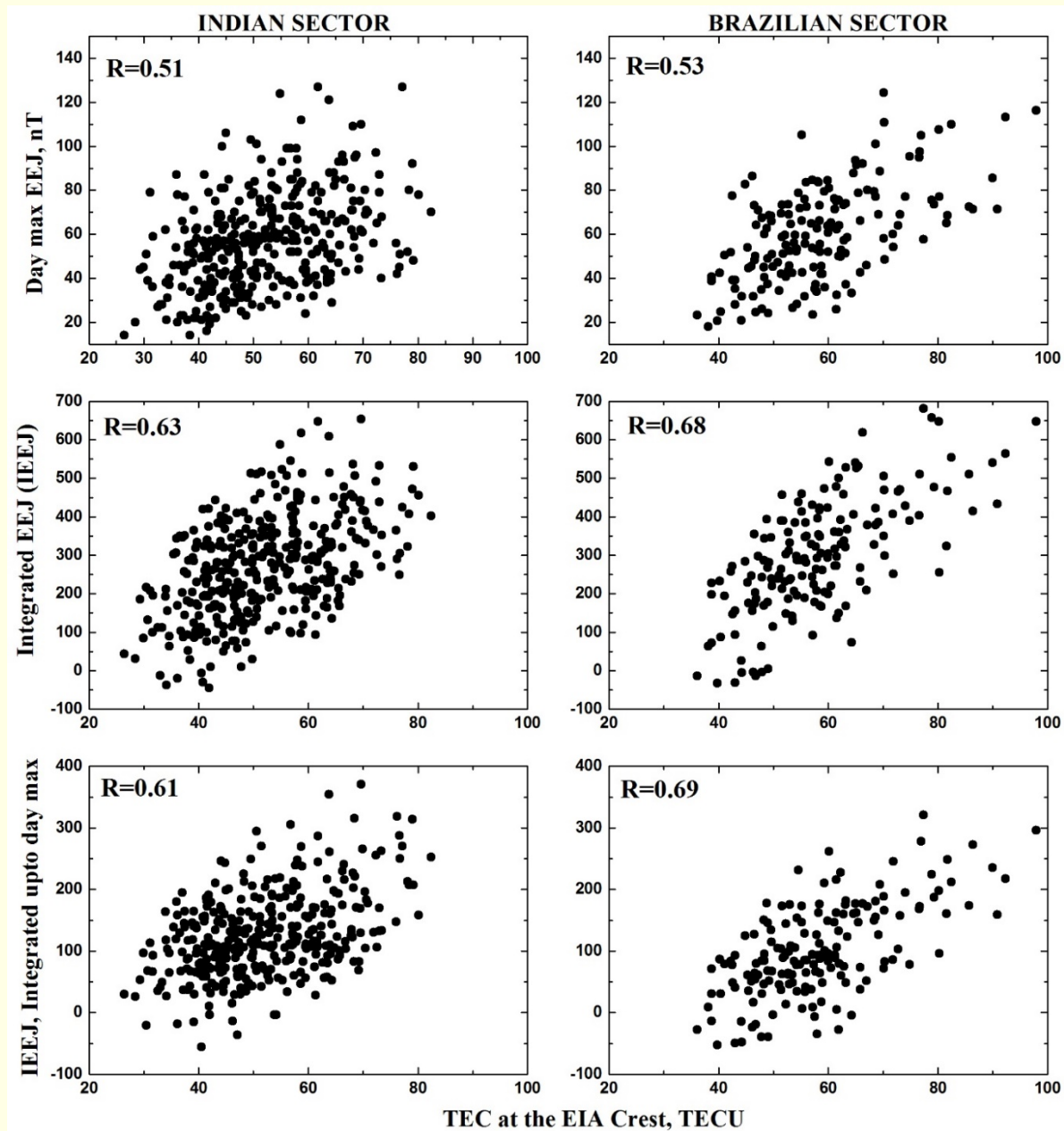


EIA and EEJ variations during different seasons



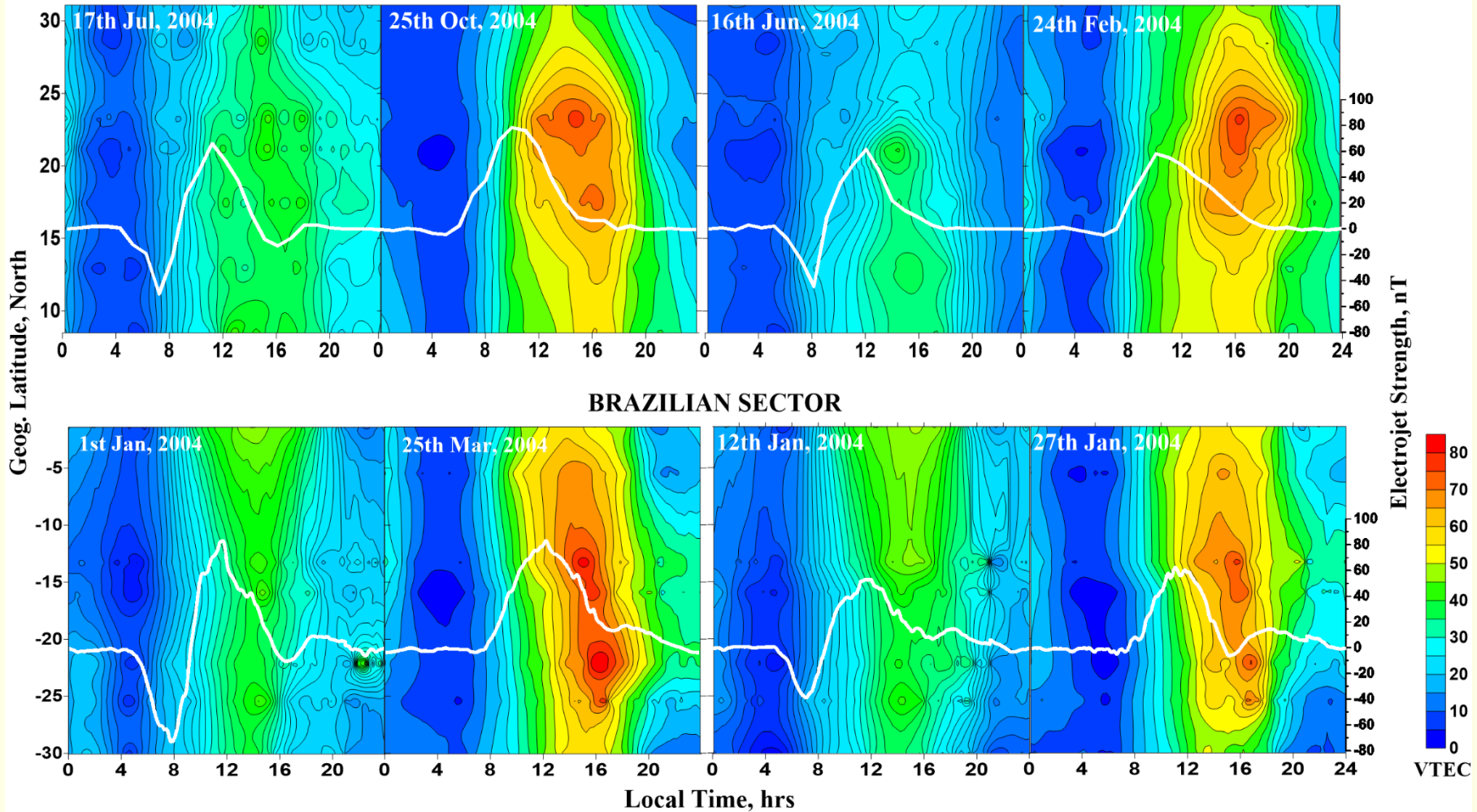


Correlation of EIA strength with different EEJ parameters

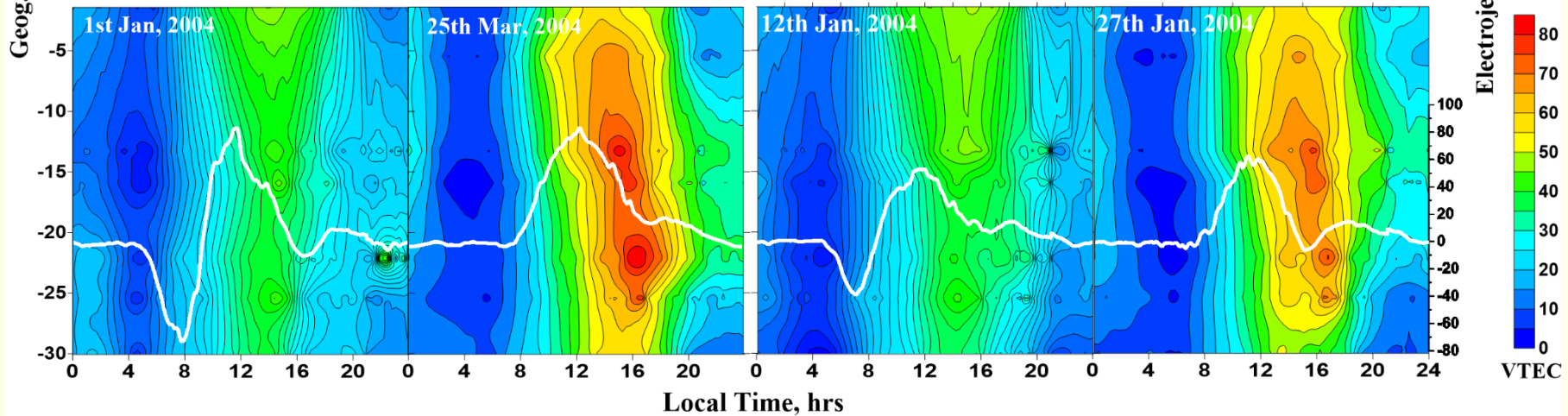


Absence of well-developed EIA during morning CEJ events

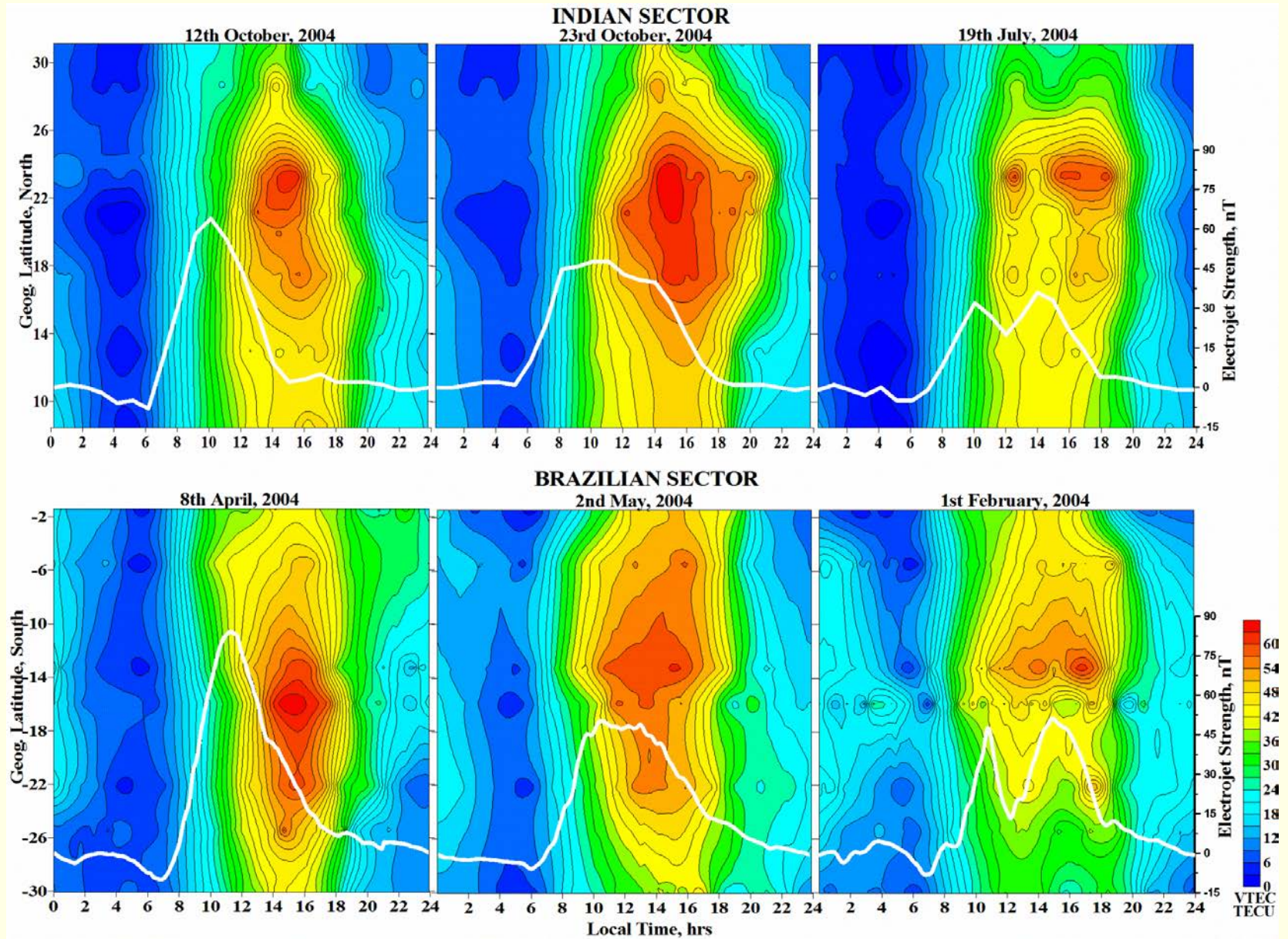
INDIAN SECTOR



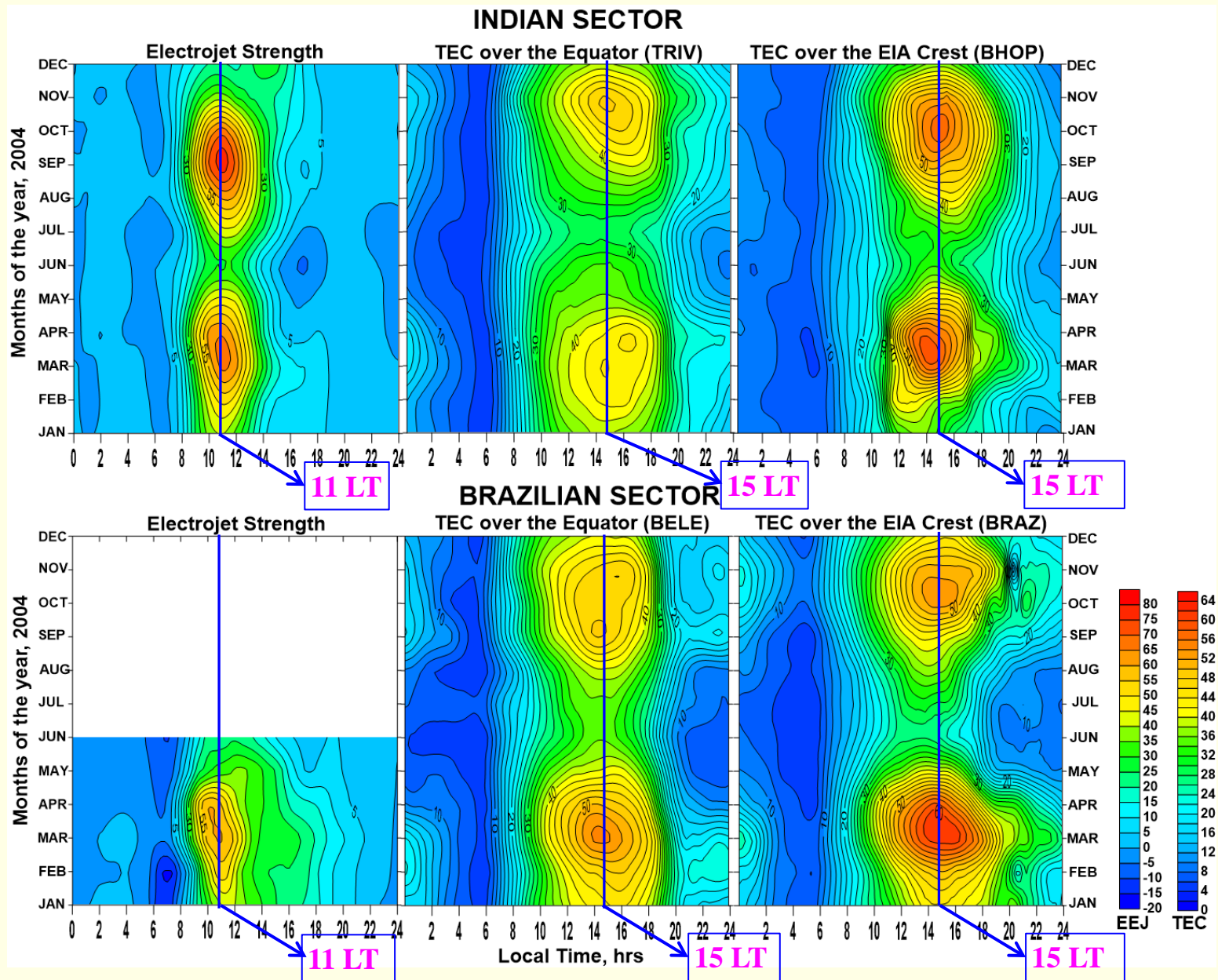
BRAZILIAN SECTOR



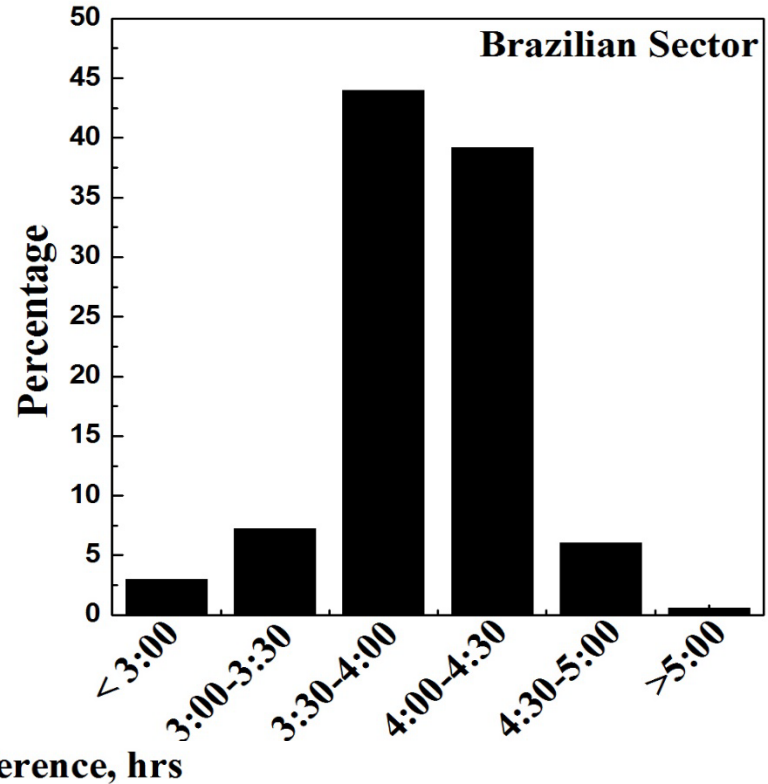
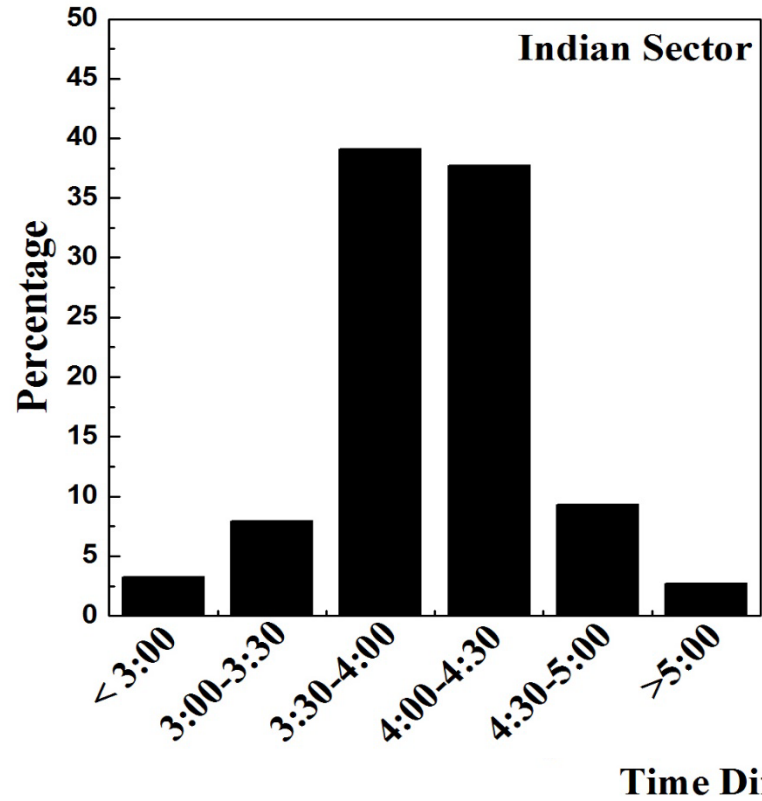
EEJ role on the diurnal extent of the EIA



Time lag between the EEJ day Maximum and well-developed EIA



Time lag between the EEJ day Maximum and well-developed EIA



Summary:

- ❖ EEJ exhibit significant differences in the diurnal characteristic over Indian and Brazilian sectors
- ❖ Major number of CEJ events are found during afternoon hours in the Indian sector while the morning CEJ events are more prominent in the Brazilian sector particularly during winter and summer months.
- ❖ The seasonal and day-to-day variabilities in TEC at the EIA crest have strong correspondence with those observed in EEJ
- ❖ The integrated EEJ strength before the day maximum shows strong dependence with the strength of the EIA
- ❖ On each particular day, the temporal extent of the well developed EIA seems to be well associated with the corresponding diurnal characteristics of the EEJ
- ❖ The two important aspects observed in this analysis are
 1. The dependence of the EIA strength on the $IEEJ_{\text{daymax}}$ &
 2. The time delay between the occurrences of the day maximum EEJ and well-developed EIA.
- ❖ This indicates that the diurnal characteristics of the EEJ can provide the information about the EIA characteristics few hours in advance.

Acknowledgements:

- ❖ To ISRO and Airport Authority of India for the GAGAN GPS-TEC Data over India and IBGE for the TEC data over Brazil
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In the memory of my Godfather
Prof. P.V.S. Rama Rao



THANK YOU