

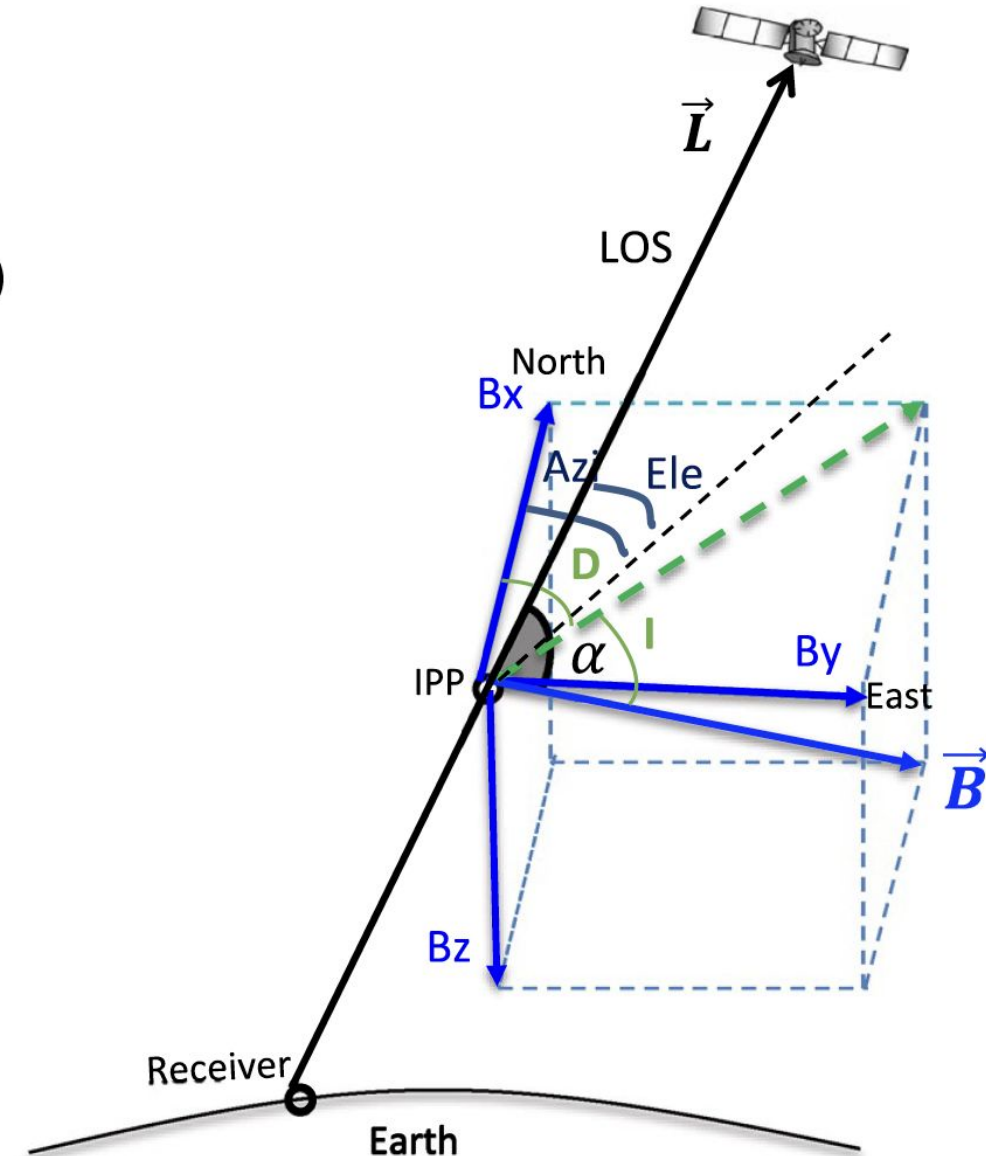
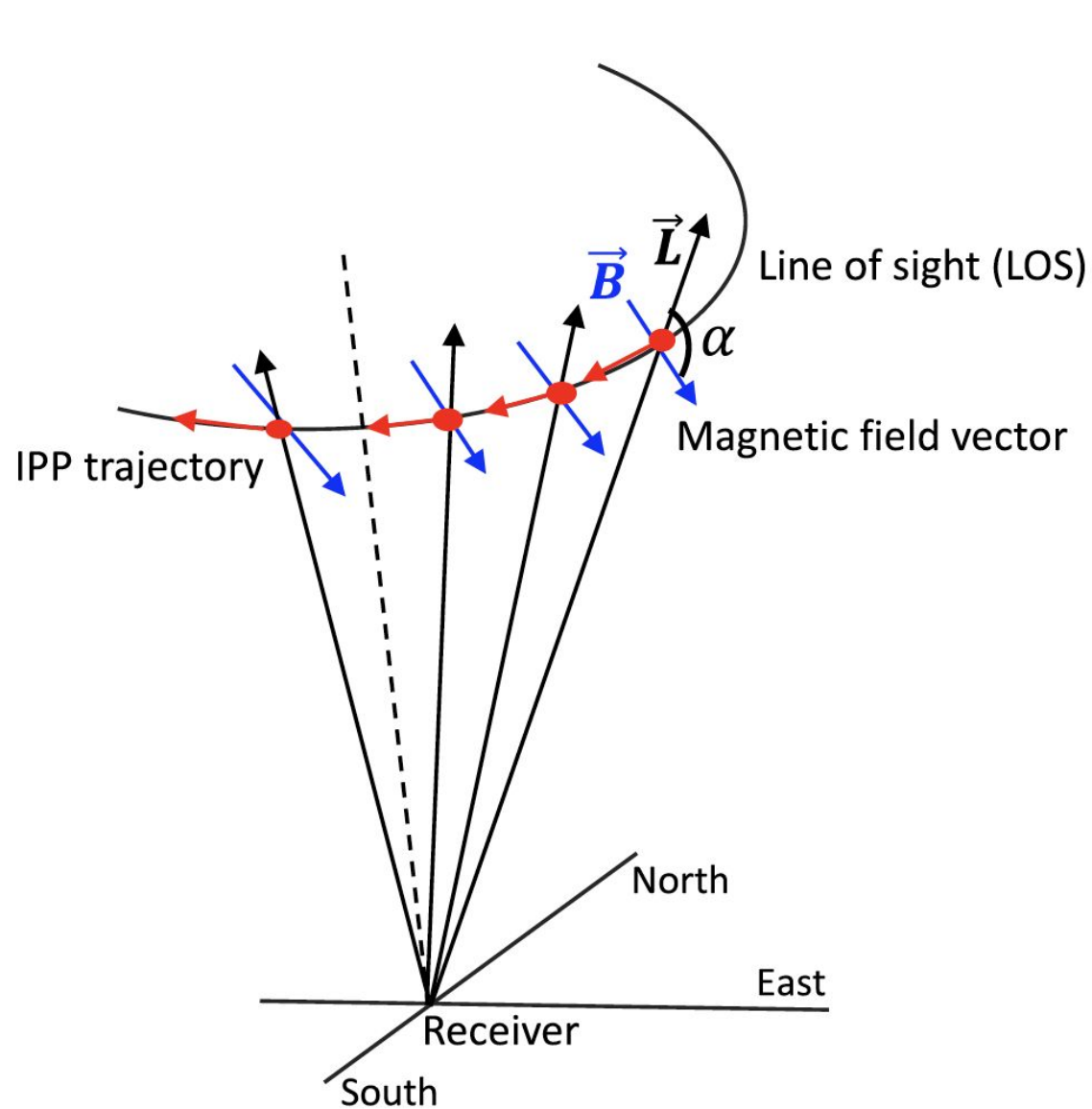
# Equatorial Scintillation Intensity and Frequency Dependence on Signal Propagation Direction

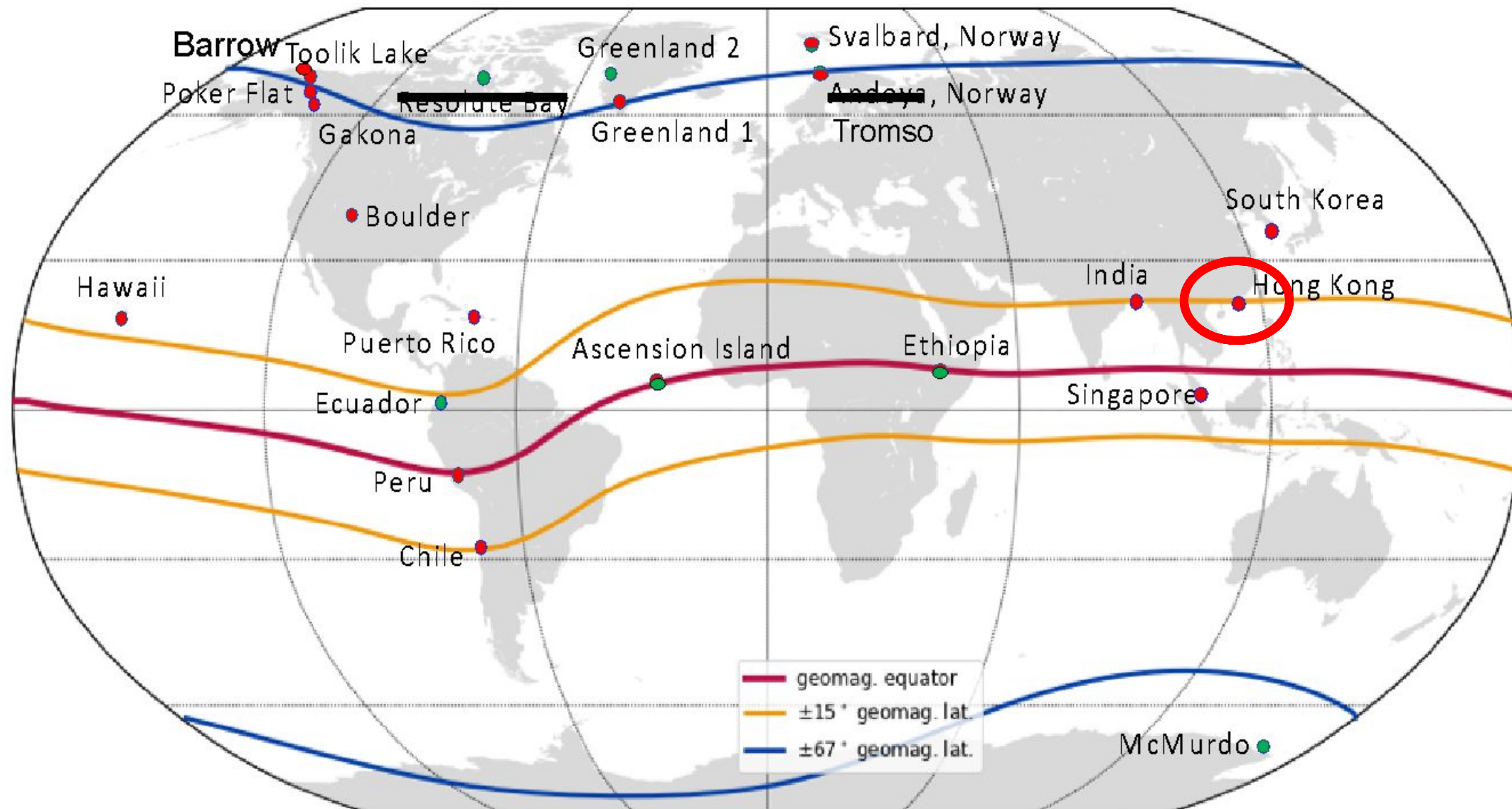
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University of Colorado Boulder  
[Jade.Morton@Colorado.edu](mailto:Jade.Morton@Colorado.edu)

JRO 60<sup>th</sup> Anniversary Workshop



# GNSS Signal Propagation Direction and B-Field Direction





# GNSS Satellite Observations

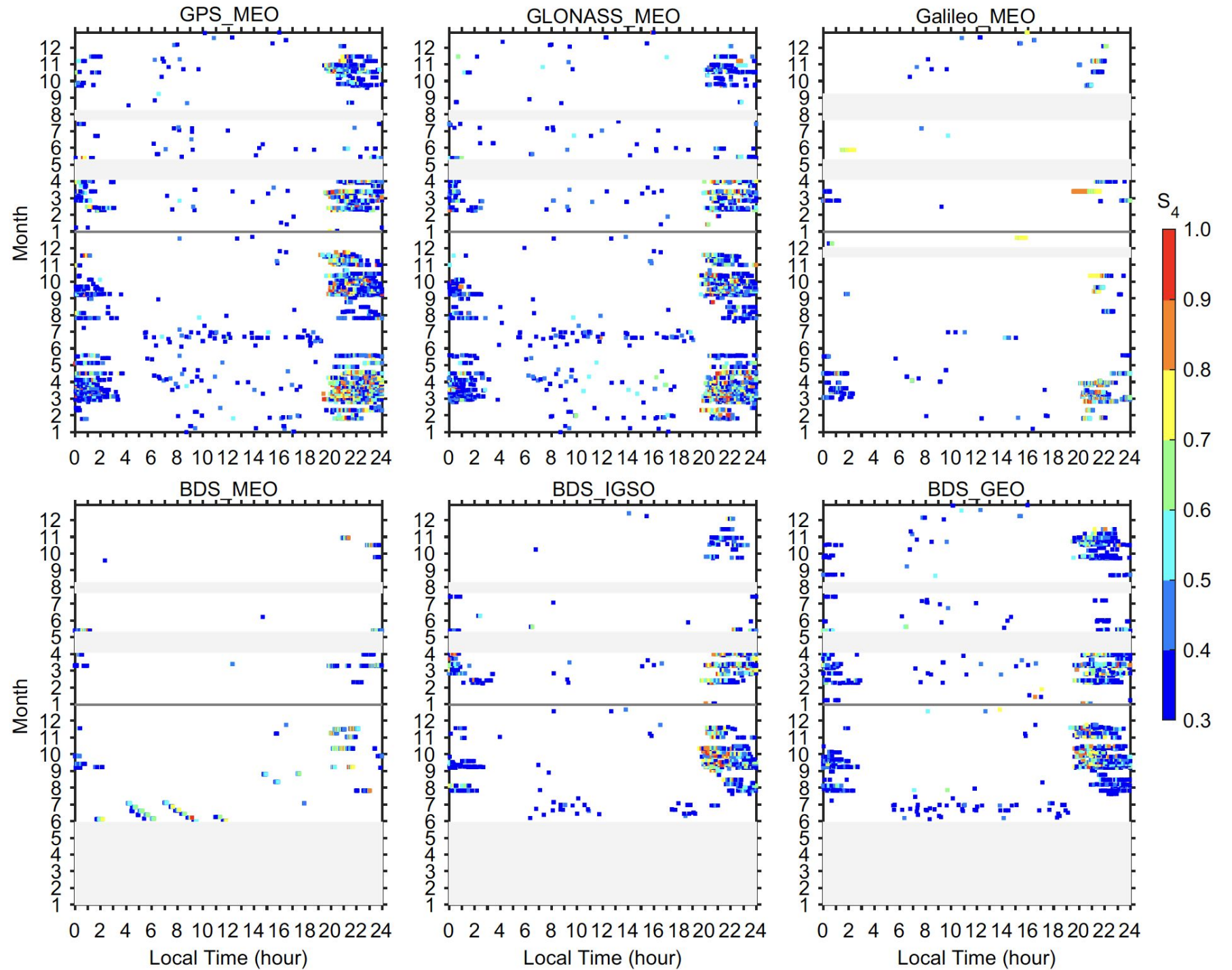
2014-2015

GNSS	GPS	GLONASS	Galileo	BDS
Band	L1	L1	E1	B1
Frequency (MHz)	1575.42	1598.06–1604.40	1575.42	1561.098
Available satellites	PRN 01–32	PRN 01–24	PRN 11–12, 18–20, 22, 24, 26 and 30	PRN 01–04, 06–12, 14
Constellation	MEO	MEO	MEO	GEO: PRN 01–04 IGSO: PRN 06–10 MEO: PRN 11, 12, 14

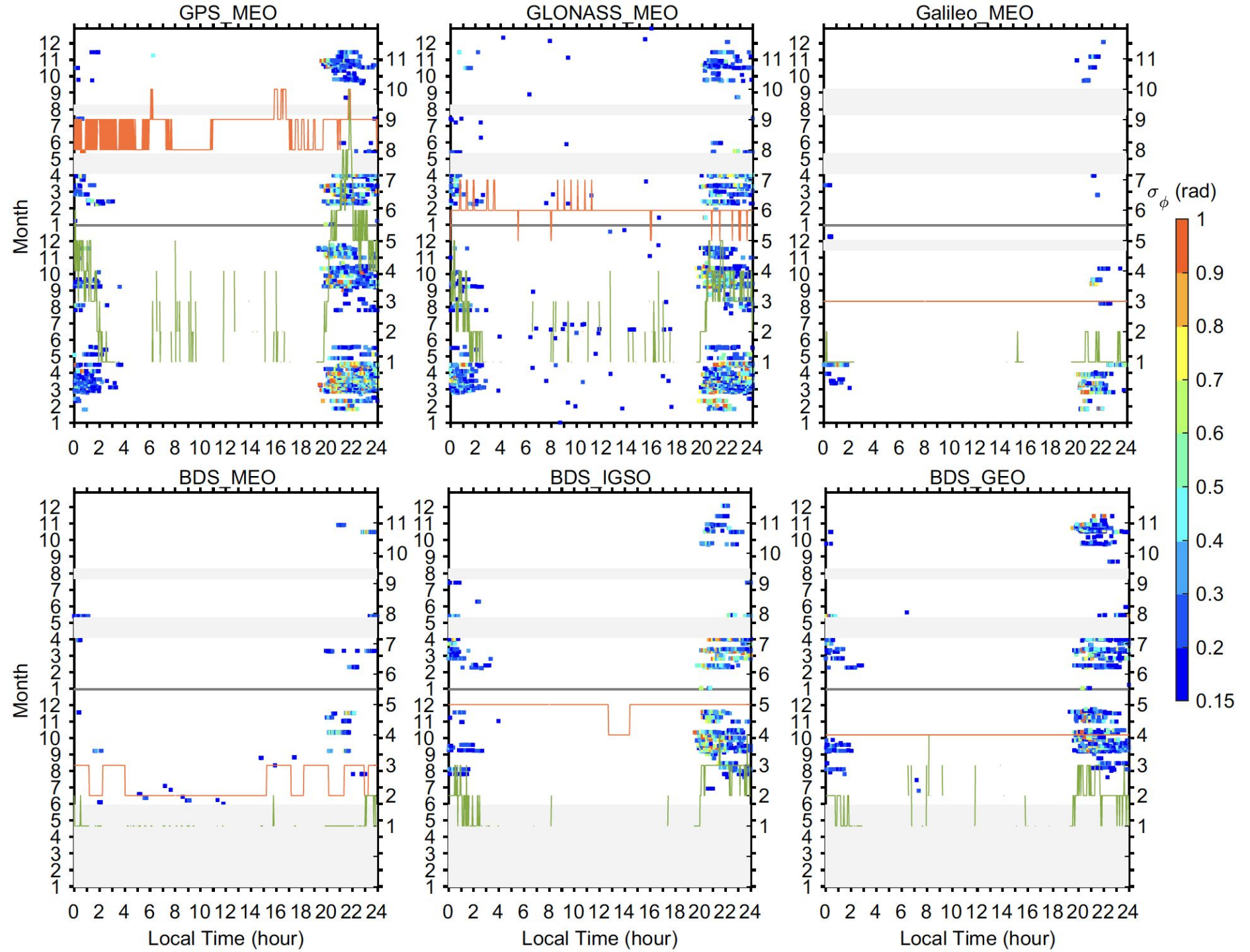




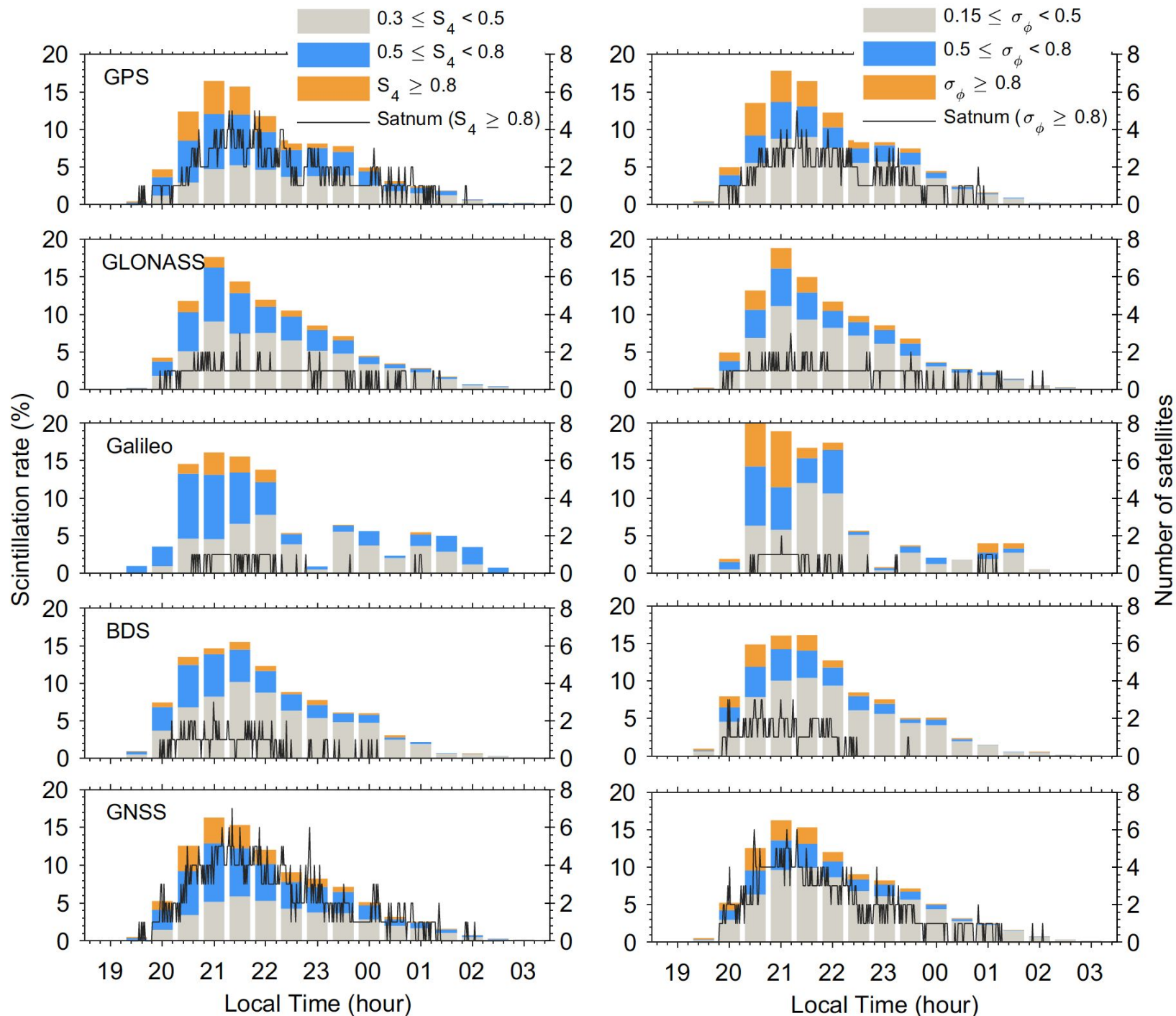
# Amplitude Scintillation



# Phase Scintillation

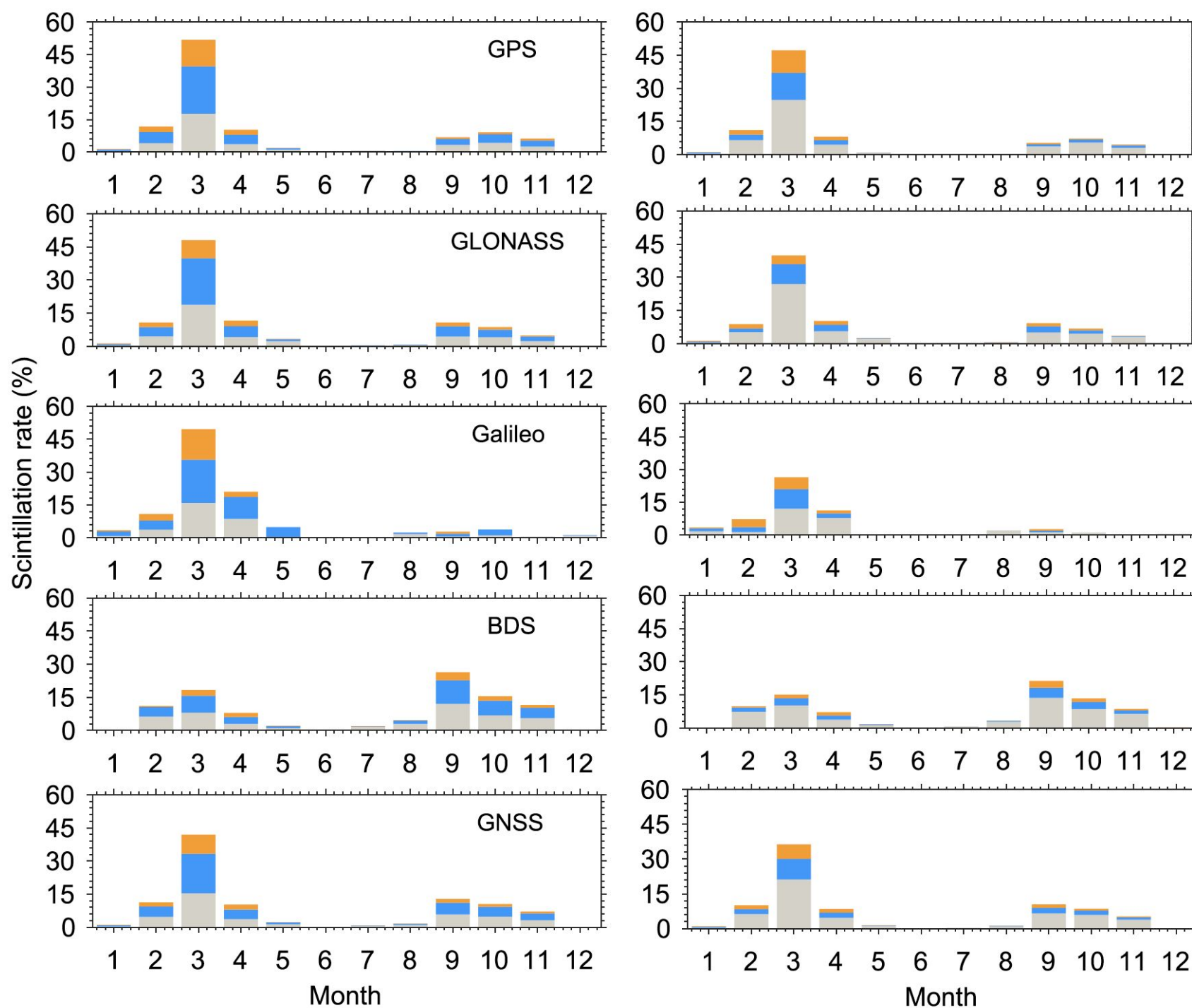


# Amplitude and Phase Scintillation Dependence on Local Time



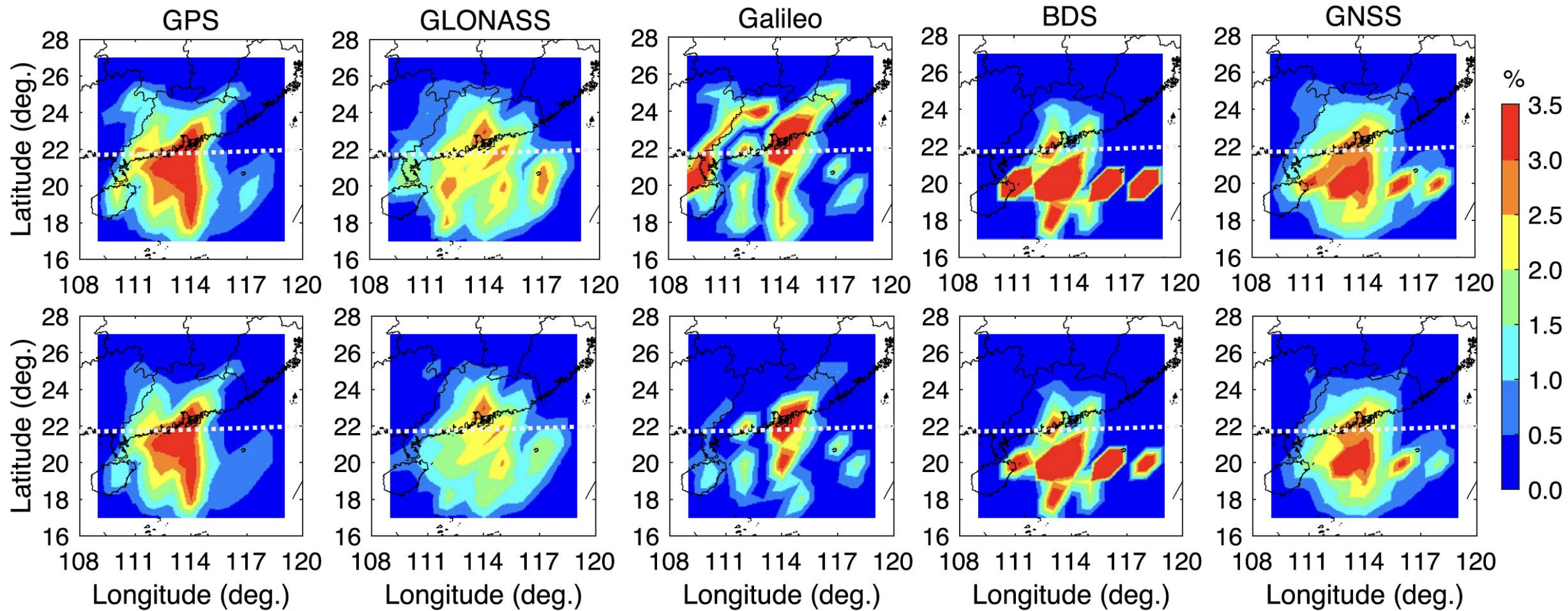


# Amplitude and Phase Scintillation Dependence on Season

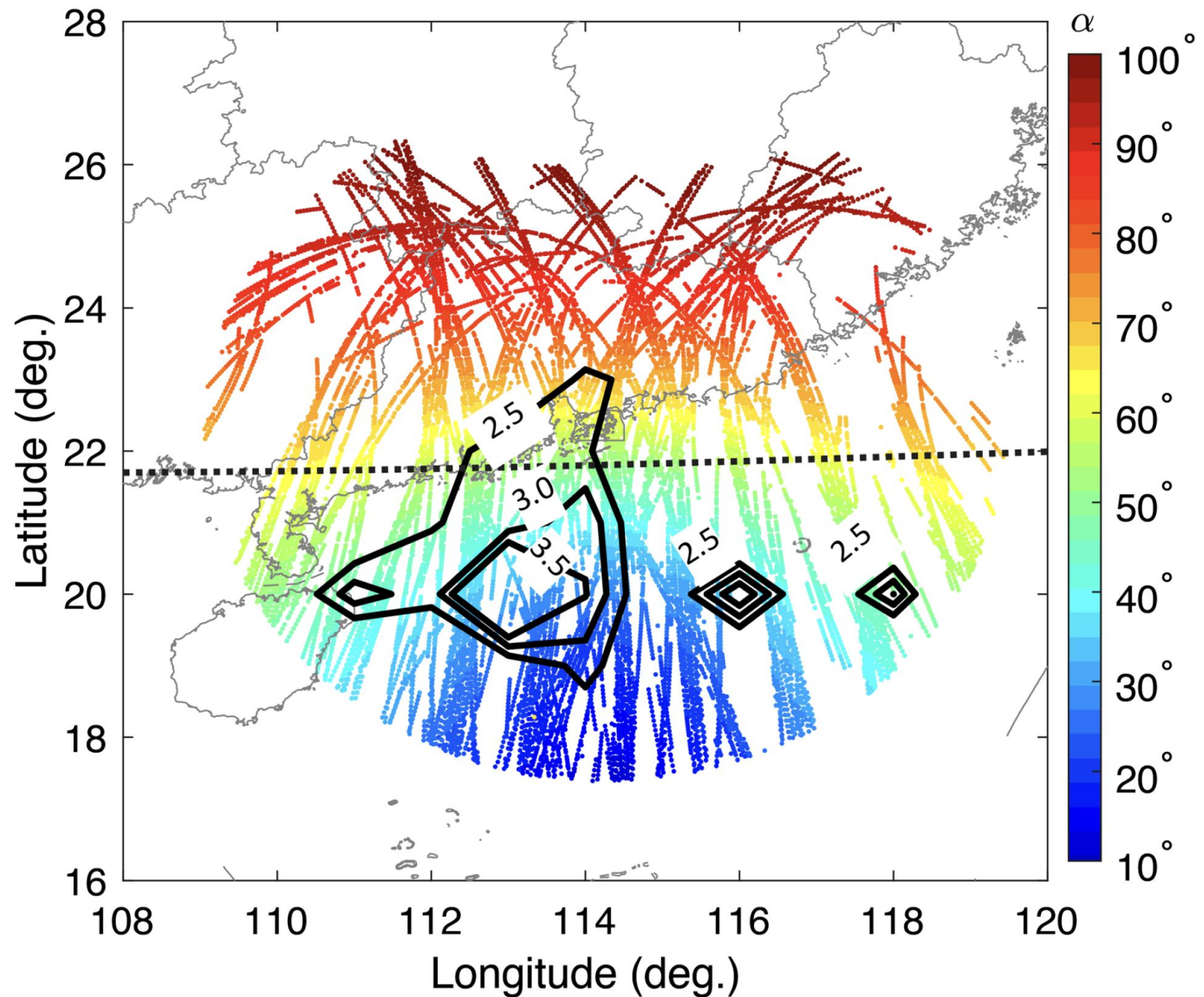




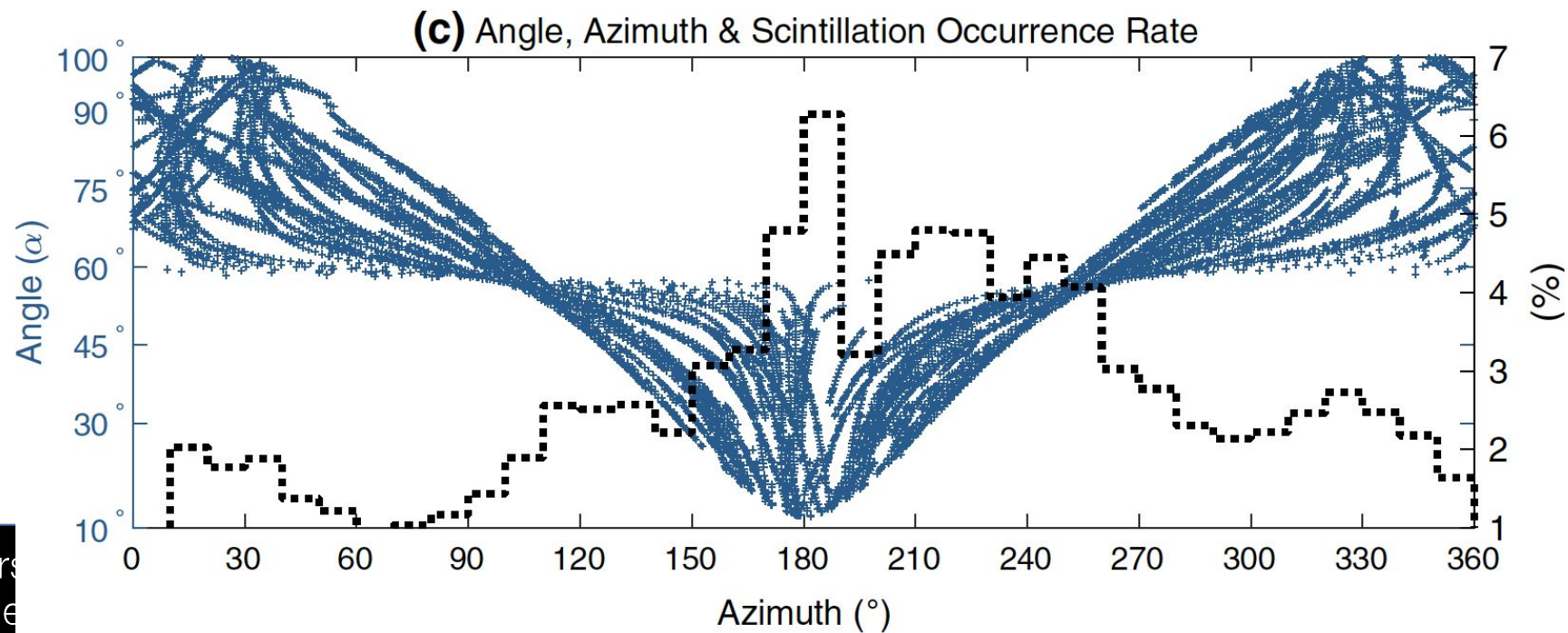
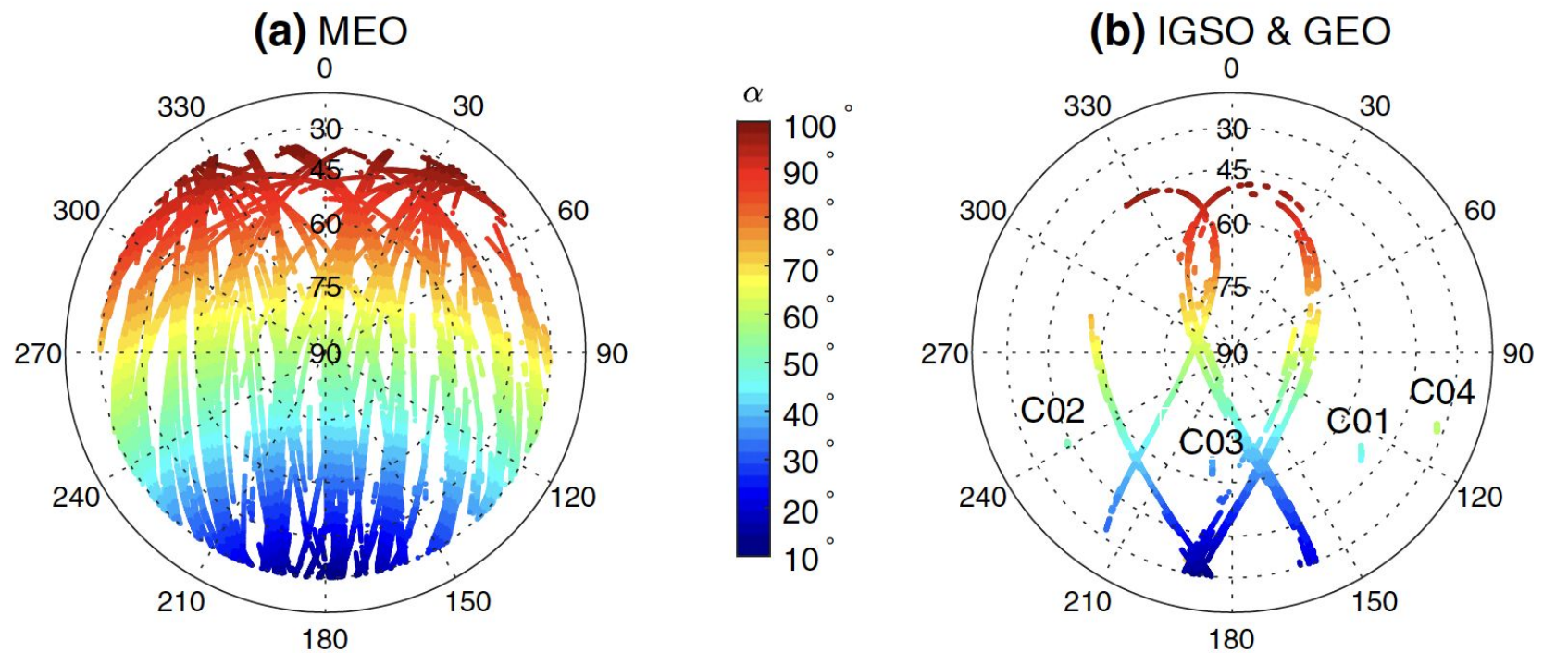
# Scintillation Occurrence Spatial Distribution

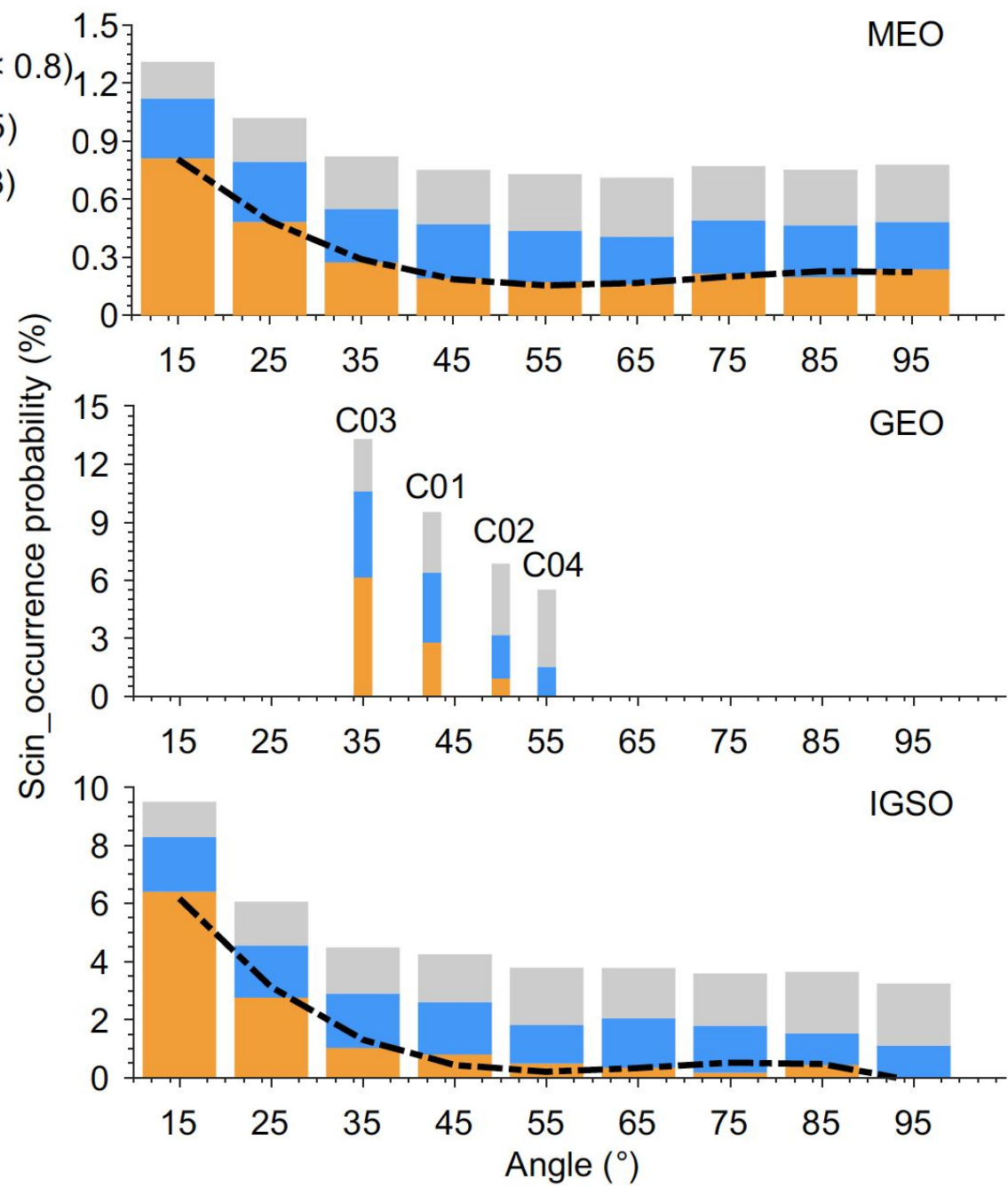
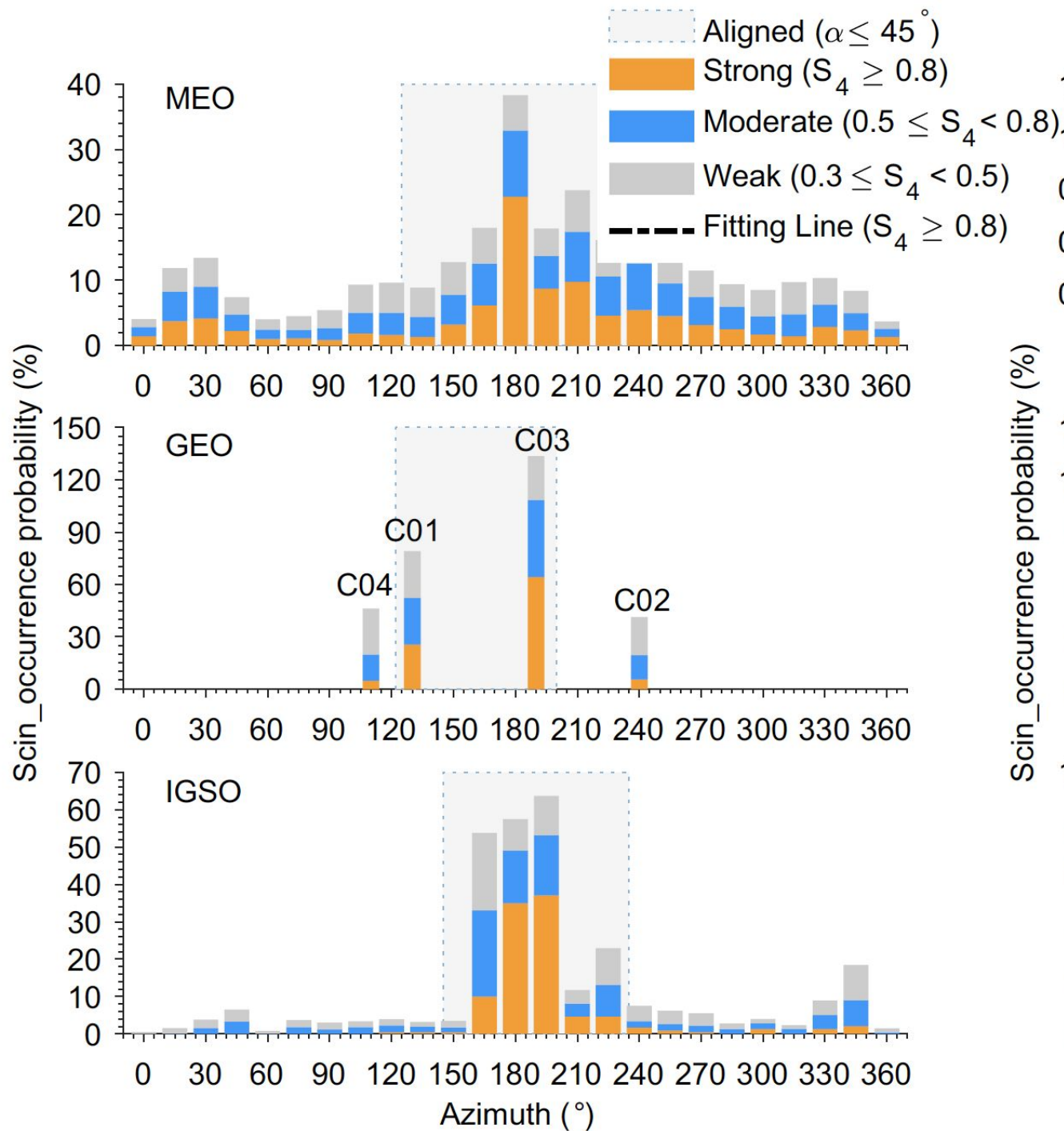


# Signal Tracks, Propagation Direction, and Strong Scintillation

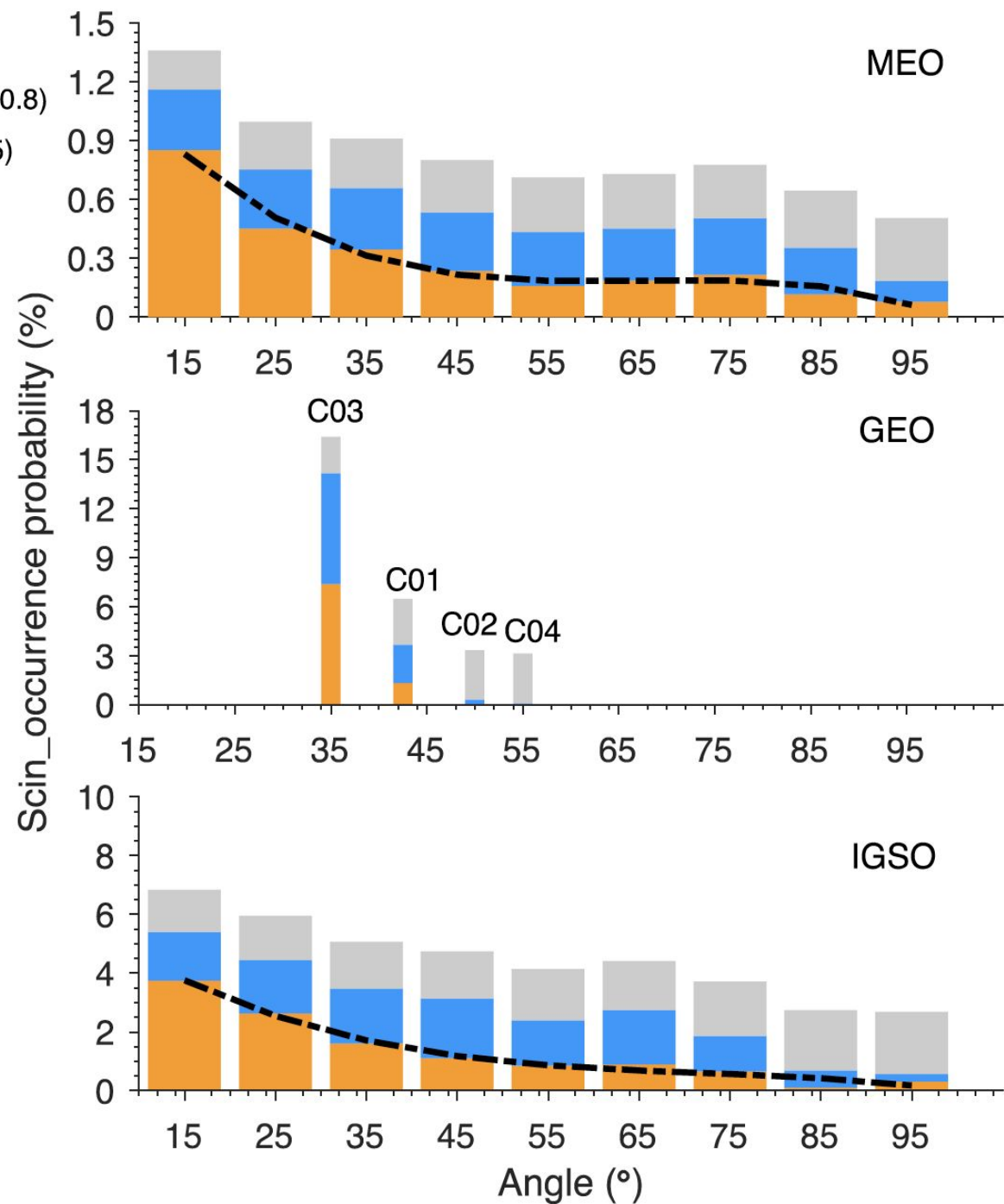
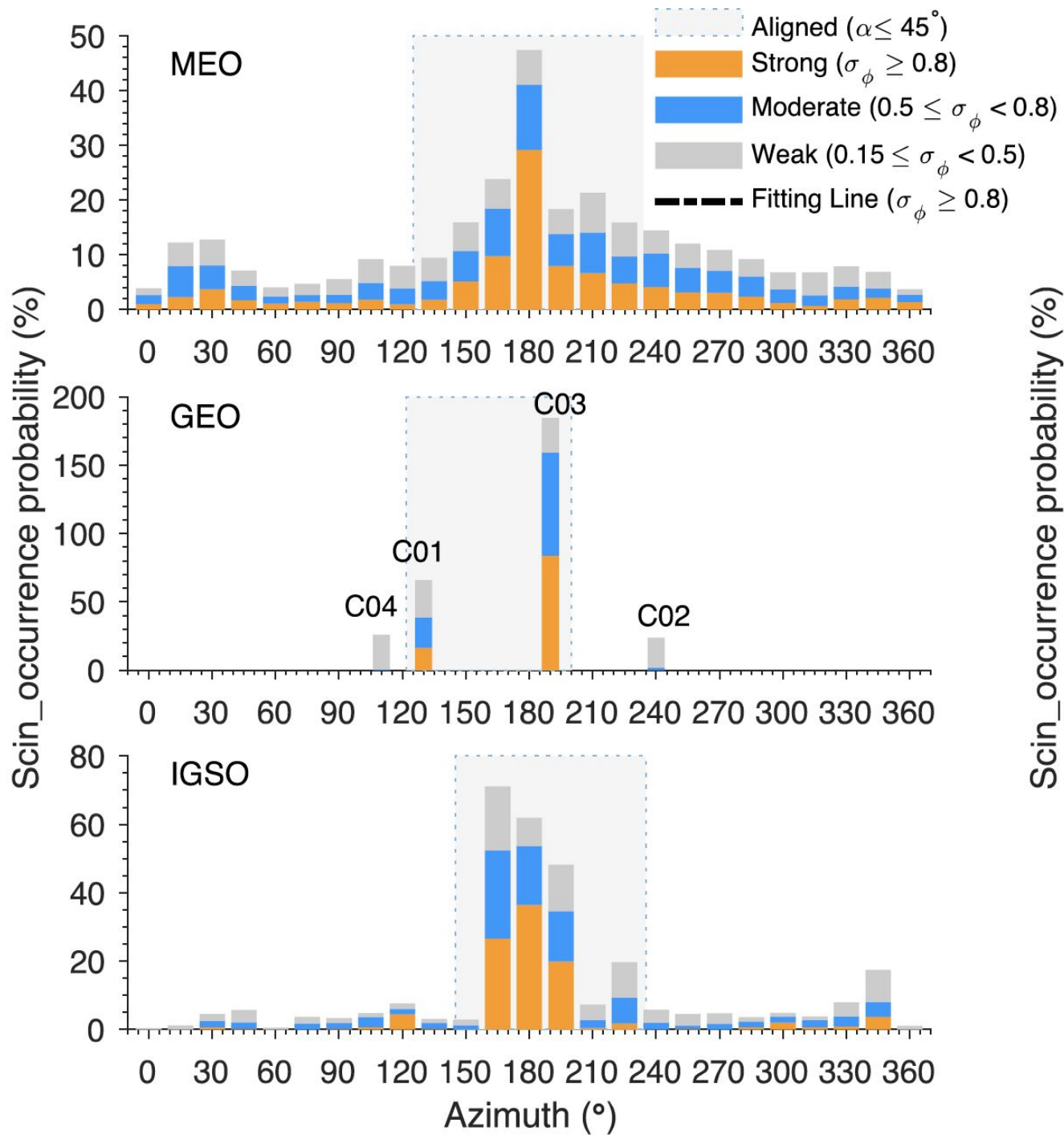


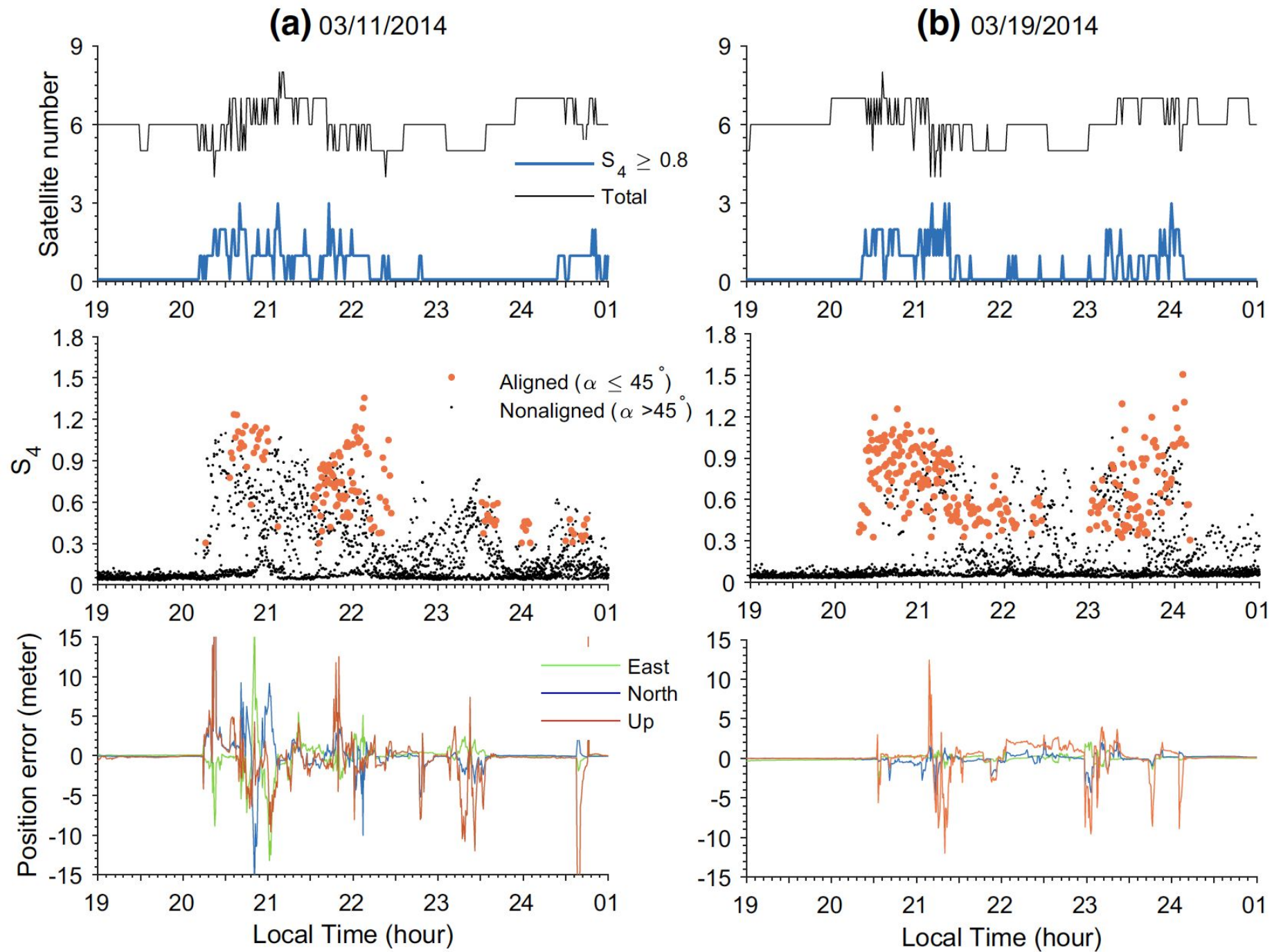


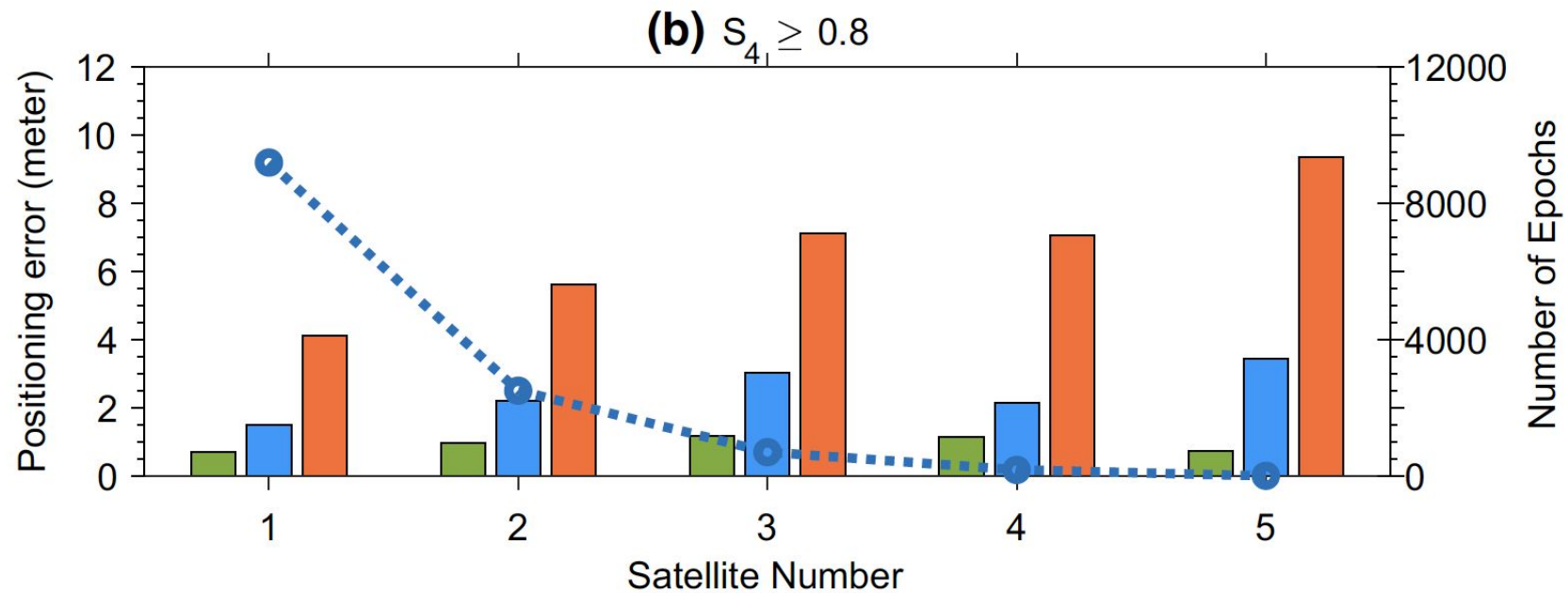
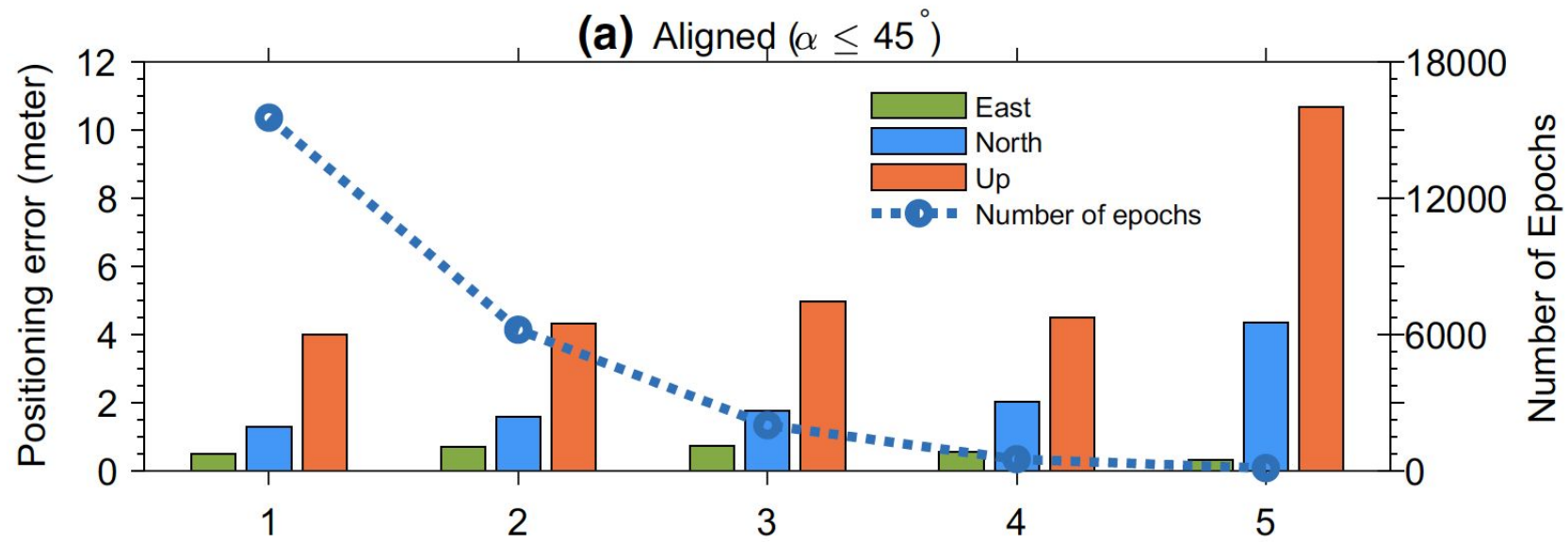












# Conclusions

We need to take into consideration of signal propagation direction relative to local magnetic field direction: a strong or weak scintillation maybe due to this relative propagation direction, not due to a change in the ionosphere.

