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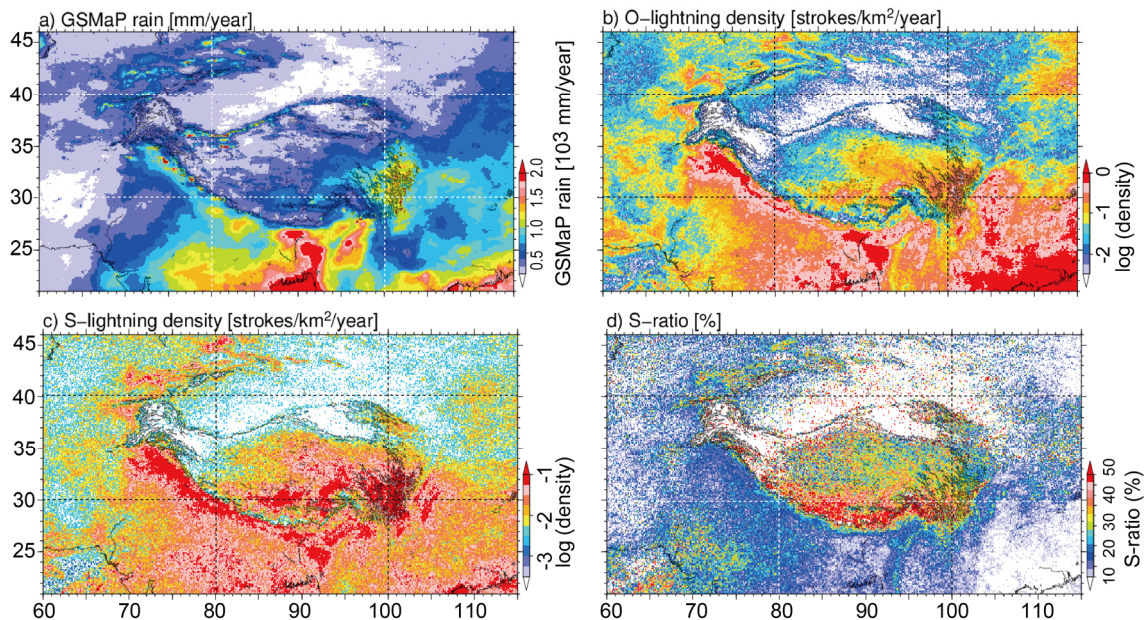


Figure 1: Distribution of GSMaP rainfall amounts and lightning features across analysis region: (a) GSMaP rainfall amount, (b) O-lightning density, (c) S-lightning density, and (d) S-ratio. Counter indicates an elevation of 4 km ASL.

- The lightning features over the Tibetan Plateau was studied using the World Wide Lightning Location Network dataset. Lightning strokes with energies above the 90th percentile (7666 J) globally are defined as strong lightning (S-lightning) strokes, and the ratio of the number of S-lightning strokes to the number of overall lightning (O-lightning) strokes is defined as the strong ratio (S-ratio). Figure 1 illustrates the distribution of the annual rainfall amount and these lightning features. Rainfall is concentrated along the southern foothills of the Himalayas (Fig. 1a), with lightning density also exhibiting high values in this region (Figs. 1b and 1c). The Tibetan Plateau east of 80° E shows high densities of O-lightning ($>10^{-1}$ stroke $\text{km}^{-2} \text{yr}^{-1}$) and S-lightning ($>10^{-1.5}$ stroke $\text{km}^{-2} \text{yr}^{-1}$). Most S-ratios in the analysis units exceeded 30% (Fig. 1d), which corresponds to three times the global mean. In particular, the S-ratios over the southern part of the Tibetan Plateau, including the Himalayas, were found to be high (50%) and to correspond with the zone that had the minimum O-lightning density.