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Lightning-Induced Transient Emissions in the mesospheric airglow layers – ISUAL Observations and Modeling

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We report the observations of Lightning-Induced Transient Emissions (LITEs) in the mesospheric airglow layers made by three narrowband filters (630-nm, 557-nm, and 762-nm) on the Imager of Sprites and Upper Atmospheric Lightning (ISUAL) onboard the FORMOSAT-II satellite. We will also present latest modeling results of these emissions using a kinetic elves model. The 630-nm, 557-nm, and 762-nm filters observe OH(9,3), O1S greenline, and O_2 atmospheric band (0,0) nightglow, respectively. We will show filtered images by the three narrowband filters and their intensity profiles. We will also present the modeling results of the intensity contributions from these three species in addition to the N21P and some other species at prescribed peak currents of the causative lightning for generating the LITEs. Comparisons between the ISUAL observations and the modeling results from the kinetic elves model will be presented.