

## Study of generation of midlatitude field-aligned irregularities with numerical simulation

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Observations of the midlatitude E-region field-aligned irregularities (FAI) with the MU radar show that distinctive quasi-periodic (QP) echoes frequently appear with more than 30 km height extent, which cannot be explained by horizontally stratified sporadic-E (Es) layers. From a numerical simulation of the midlatitude E-region plasma, it was found that horizontal structures of Es layers play an important role for the generation of polarization electric fields. Even if Es layers are uniform, intense polarization electric fields can be generated by modulation of neutral wind field. The generated polarization electric fields were mapped along the geomagnetic field up to the higher E-region, and formed plasma density structures along the geomagnetic field.