# Study of generation of polarization electric fields associated with a sporadic-E layer

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The quasi-periodic (QP) radar echoes of the ionospheric irregularities in the E-region
as first observed with the MU radar and studied for more than ten years. From the rocket experiment SEEK campaign conducted in 1996, the intence electric field of more than 10 mV/m associated with the QP echoes was detected. After the SEEK campaign, the new model to explain such a large electric field by the internal structure of a sporadic-E layer was proposed.

On August 3, 2002, SEEK-2 campaign was successfully conducted to reveal the generation mechanism of the QP echoes. Two rockets (S-310-31 and S-310-32) were launched at 23:24 and 23:39 JST. Electric field was observed with the first rocket. The electric fields with a maximum amplitude of about 10 mV/m were observed around an altitude of 100 km where the sporadic-E layers were detected. Above 120 km, there were large scale modulation of the electric fields with a maximum of 5 mV/m. We will compare the result with other observations, electron density, TEC, and neutral wind, and perform a numerical simulation to investigate the genration mechanism of large polarization electric field.