## A Study on the respective roles of Kelvin-Helmholtz Instabilities and Gravity waves in the generation of Quasi-Periodic echoes at Gadanki

R. K. CHOUDHARY

Space Physics Laboratory, VSSC, Trivandrum A.K. PATRA National Atmospheric Research Laboratory, Gadanki

Quasi-periodic (QP) echoes, identified in range-time-intensity (RTI) plots as tilted striped striations, are coherent radar echoes thought to be associated with sporadic E layers (Es). The understanding on the genesis mechanism of these echoes, however, is still far from clear. Efforts have been made to associate them either with Kelvin-Helmholtz Instabilities (KHI) or with Gravity waves. These processes, however, have always been treated in isolation and be en assumed to be unconnected to each other. Using Gadanki radar observations, we, for the first time, present an evidence which shows an interplay between KHI and Gravity waves generating QP echoes. On June 29, 2004 a necklace like structure comprising of QP like striations was seen in RTI plot. Echo region slided down by altitude as high as 2 km, only to climb up again to form a neck-lace like structure in about one hour. At the same time, QP striations showed a positive tilt with a near continuous layer at the top. We discuss the results in detail and show how gravity waves act as a seed to generate KH Instabilities resulting in QP echoes as seen by the coherent backscatter radars.