

PRINCIPAL COMPONENT ANALYSIS OF SUB-IONOSPHERIC VLF PROPAGATION CONDITIONS

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Very Low Frequency (VLF) waves propagate with insignificant attenuation in the Earth-ionosphere waveguide. Attenuation is, however, appreciably higher on illuminated paths due to the presence of the ionospheric D region. Propagation conditions may be monitored using a narrow-band receiver tuned to the stable signals from numerous VLF transmitters distributed across the surface of the Earth. The passage of the day-night terminator across the transmitter-receiver path has a characteristic signature on the amplitude and phase of the signal. Principal Component Analysis (PCA) has been applied to distinguish between the regular diurnal signal variation and exogenous perturbations.

PCA, VLF, ionosphere

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