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Statistical analysis of ELF/VLF plasma emissions observed within Earth's radiation belts

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The new database of electromagnetic plasma emissions observed within Earth's radiation belts has been constructed using three years of data obtained by the Dynamic Explorer - 1 spacecraft. The resulting 3D distributions of the spectral density of magnetic and electric oscillations measured in the frequency range from 100 Hz to 400 kHz allows to compare relative contribution of various types of electromagnetic emissions (such as equatorial electromagnetic emissions, plasmaspheric hiss, chorus, VLF transmissions) into the plasma wave spectrum. Unlike previous developments the new database contains spectral densities as a function of local plasma gyrofrequency that simplifies the identification of emission type. The database can be utilized to model the dynamics of wave-particle interactions in the radiation belts explaining relative role of various emissions in the scattering and/or energizing radiation belt particles.