

On the possible altitude dependence of Schumann resonance frequencies

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Based on a realistic conductivity profile, the numerical modelling of the electromagnetic wave propagation in the cavity bounded by the Earth' conducting surface and the ionosphere has shown that Schumann frequencies depend on height. At altitudes above 70 km, where the conductivity becomes high, a gradual decrease in the frequency has been found. This can be attributed to the fact that although the peaks for the total electromagnetic energy stored inside the cavity define a unique value for each Schumann resonance, the experimental determination of Schumann frequencies related with the maxima in the amplitude of the electromagnetic field Fourier transform spectrum is sensitive to the conductivity profile and will thus change with altitude. We show that a similar frequency shift can be obtained by using a simple analytical model for the Earth-ionosphere cavity.