



## Schupy: a python package for modeling and analyzing Schumann resonances

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Schupy is an open-source python package aimed at modeling and analyzing Schumann resonances (SRs), the global electromagnetic resonances of the Earth-ionosphere cavity resonator in the lowest part of the extremely low frequency band (<100 Hz). Its very-first function `forward_tdte` applies the solution of the 2-D telegraph-equation introduced recently by Pracser et al. (2019) for a uniform cavity and is able to determine theoretical SR spectra for arbitrary source-observer configurations. It can be applied for modeling both the amplitude and phase of extraordinarily large SR-transients and the power spectral density of SRs excited by incoherently superimposed lightning strokes within an extended source region.

In this contribution, test results of planned new functionalities of the package are presented. A new function aims at removing sections of the measured data, e.g. Q-bursts, which bias spectral characteristics of natural “background” electromagnetic noise. This way, PSD will be calculated from a sanitized time series. Other new functions are introduced for determining the spectral parameters (amplitude/intensity, frequency, Q-factor) of SR modes using different approaches, i.e., symmetrical and asymmetrical Lorentzian fitting, complex demodulation, and the weighted average method. We would like to encourage the community to join our project in developing open-source modeling and signal analyzing capacities for SR research as part of the schupy package.