PyRBSP v1.0 provides functionality for extracting the chorus wave amplitude squared, B_w^2, for upper and lower band chorus as measured outside the plasmasphere by the RBSP spacecraft using diagonal elements of the magnetic cross spectral matrix measured by the EMFISIS WFR instrument. Linear regression models of the time averaged value of B_w^2 are created. The average value of B_w^2 is parametrized as:

$$\left\langle B_w^2(\mathrm{MLT}, L, \lambda, \mathrm{Kp})\right\rangle = f(\mathrm{MLT}, L, \lambda)\ g(\mathrm{Kp}) \tag{1}$$

where $f(\mathrm{MLT}, L, \lambda)$ can be written as

$$f(\mathrm{MLT}, L, \lambda) = f(a, b, L, \lambda) \tag{2}$$

where $a = \cos(\mathrm{MLT} \times \pi/12)$ and $b = \sin(\mathrm{MLT} \times \pi/12)$, and f is a first order polynomial in a and b and a second order polynomial in L and λ and includes cross terms.

In order to ease the computation of quasi-linear diffusion coefficients, the Kp dependence is separately calculated as a fourth order polynomial in Kp, $g_o(\mathrm{Kp})$, which is then scaled to a mean value of 1 in the range of Kp=0 to 6. Thus, $g(\mathrm{Kp})$ is a dimensionless scaling constant.

$$g(\mathrm{Kp}) = \frac{g_o(\mathrm{Kp})}{\frac{1}{6}\int_0^6 g_o(\mathrm{Kp})d\mathrm{Kp}} = \frac{g_0(\mathrm{Kp})}{G_0} \tag{3}$$

The coefficients are computed separately for upper and lower band chorus and output as csv files. The model is valid in the range MLT=[0,24], L=[3.5,6], $|\lambda|$=[0,18], and Kp=[0,6].