

- **bremss, vbremss, zbremss: thermal bremsstrahlung**

A thermal bremsstrahlung spectrum based on the Kellogg, Baldwin & Koch (ApJ 199, 299) polynomial fits to the Karzas & Latter (ApJS 6, 167) numerical values. A routine from Kurucz (private communication) is used in at low temperature end. The He abundance is assumed to be 8.5 % of H by number.

Choice of fixed redshift is allowed by using **zbremss** variant

Choice of Hydrogen to Helium abundance ratio is allowed by using the **vbremss** variant.

The parameter settings are thus:

For **bremss**:

par1 plasma temperature in keV

norm $\frac{3.02 \times 10^{-15}}{4\pi D^2} \int n_e n_i dV$, where D is the distance to the source (cm) and n_e, n_i are the electron and ion densities (cm^{-3})

For **zbremss**:

par1 plasma temperature in keV

par2 = z redshift

norm $\frac{3.02 \times 10^{-15}}{4\pi D^2} \int n_e n_i dV$, where D is the distance to the source (cm) and n_e, n_i are the electron and ion densities (cm^{-3})

For **vbremss**:

par1 plasma temperature in keV

par2 $n(\text{He})/n(\text{H})$ (note that the Solar ratio is 0.085)

norm $\frac{3.02 \times 10^{-15}}{4\pi D^2} \int n_e n_i dV$, where D is the distance to the source (cm) and n_e, n_i are the electron and ion densities (cm^{-3})