

sedov, vsedov: sedov model, separate ion/electron temperature

Sedov model with separate ion and electron temperatures. This model is slow. `par1` provides a measure of the average energy per particle (ions+electrons) and is constant throughout the postshock flow in plane shock models (Borkowski et al., 2001, ApJ, 548, 820). `par2` should always be less than `par1`. If `par2` exceeds `par1` then their interpretations are switched (ie the larger of `par1` and `par2` is always the mean temperature). Additional references can be found under the help for the `equil` model. Several versions are available. To switch between them use the **xset** `neivers` command. **xset** `neivers 1.0` gives the version from xspec v11.1, **xset** `neivers 1.1` uses updated calculations of ionization fractions using dielectronic recombination rates from Mazzotta et al (1988), and **xset** `neivers 2.0` uses the same ionization fractions as 1.1 but uses APED to calculate the resulting spectrum. Note that versions 1.x have no emission from Ar. The default is version 1.1.

The **sedov** model has relative abundances determined by the solar Anders and Grevesse mixture, while the **vsedov** variant allows the user to set the abundances.

Parameters for **sedov** are:

<code>par1</code>	mean shock temperature (keV)
<code>par2</code>	electron temperature immediately behind the shock front (keV)
<code>par3</code>	Metal abundances (He fixed at cosmic). The elements included are C, N, O, Ne, Mg, Si, S, Ar, Ca, Fe, Ni. Relative abundances are defined by the <code>abund</code> command
<code>par4</code>	ionization age (s cm^{-3}) of the remnant (= electron density immediately behind the shock front multiplied by the age of the remnant)
<code>par5</code>	redshift z
<code>norm</code>	$\frac{10^{-14}}{4\pi [D_A(1+z)]^2} \int n_e n_H dV$ where D_A is the angular diameter distance to the source (cm), and n_e , n_H (cm^{-3}) are the electron and hydrogen densities respectively.

For **vsedov** the parameters are:

par1	mean shock temperature (keV)
par2	electron temperature immediately behind the shock front (keV)
par3	H density in cm^{-3}
par4-par15	Abundances for He, C, N, O, Ne, Mg, Si, S, Ar, Ca, Fe, Ni wrt Solar (defined by the abund command)
par4	ionization age (s cm^{-3}) of the remnant (= electron density immediately behind the shock front multiplied by the age of the remnant)
par5	redshift z
norm	$\frac{10^{-14}}{4\pi[D_A(1+z)]^2} \int n_e n_H dV$ where D_A is the angular diameter distance to the source (cm) , and n_e , n_H (cm^{-3}) are the electron and hydrogen densities respectively.