

1) 186(a) : Metric for Spherically Symmetric Spacetime.

Assuming Comoving this is:

$$ds^2 = \exp(2d(r, t)) c^2 dt^2 - \exp(2p(r, t)) dr^2 - r^2 d\phi^2 \quad - (1)$$

$$\text{with} \quad e^{2d} = e^{-2p} \quad - (2)$$

The general Comoving metric is:

$$ds^2 = -A(c(r))^{1/2} c^2 dt^2 + B(c(r))^{1/2} dr^2 + c(r) d\phi^2 \quad - (3)$$

$$\text{with} \quad c(r) = (|r - r_0|^n + d^n)^{2/n} \quad - (4)$$

These are diagonal metrics. In pure mathematics there may be more general metrics for different spacetimes. These metrics must be deduced without use of the Einstein field equation.
