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Addendum: Conductivity of a Relativistic Plasma

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Equation (37) can be generalized to give the collision term for a Maxwellian colliding off an arbitrary azimuthally symmetric spherical harmonic:

$$\begin{aligned}
&\frac{C^{s/s'}(f_{sm}(u), f_{s'l}(u)P_l(\cos\theta))}{f_{sm}(u)P_l(\cos\theta)} \\
&= \frac{4\pi\Gamma^{s/s'}}{n_{s'}}\left\{\frac{m_s}{m_{s'}}\left[\frac{1}{\gamma}\psi_{s'l[0]} - \frac{u}{u_{ts}^2}\frac{d\psi_{s'l[1]1}}{du} - \frac{2}{c^2\gamma}\psi_{s'l[1]1} + \frac{2u}{c^2u_{ts}^2}\frac{d\psi_{s'l[2]11}}{du}\right] + \frac{u}{u_{ts}^2}\frac{d\psi_{s'l[1]0}}{du}\right. \\
&\qquad - \left(\frac{u^2}{\gamma u_{ts}^4} - \frac{1}{u_{ts}^2}\right)\psi_{s'l[1]0} + \left(\frac{2\gamma u}{u_{ts}^4} - \frac{2u}{c^2u_{ts}^2}\right)\frac{d\psi_{s'l[2]02}}{du} \\
&\qquad \left. - \left(\frac{l(l+1)}{\gamma u_{ts}^4} - \frac{2}{c^2u_{ts}^2}\right)\psi_{s'l[2]02} - \frac{8\gamma u}{c^2u_{ts}^4}\frac{d\psi_{s'l[3]022}}{du} + \frac{4(l+2)(l-1)+8\gamma^2}{\gamma c^2 u_{ts}^4}\psi_{s'l[3]022}\right\}.
\end{aligned}$$

These is a sign error in the exponential term in Eq. (41). It should read:

$$\bar\sigma = \frac{1}{3\Theta^{7/2}K_2(\Theta^{-1})}\left(\frac{E_1(\Theta^{-1})}{\Theta} - (1 - \Theta + 2\Theta^2 - 6\Theta^3 - 24\Theta^4 - 24\Theta^5)\exp(-\Theta^{-1})\right). \qquad (41)$$