Erratum: Retardation magnification and the appearance of relativistic jets

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The paper ‘Retardation magnification and the appearance of relativistic jets’ was published in Mon. Not. R. Astron. Soc. 389, 1507–1520 (2008).

The half-opening angle \( \zeta \) of the ‘beaming cones’ in Fig. 3 of the paper was given incorrectly as \( \zeta = \Gamma / 2 \) in the figure caption, and drawn incorrectly as \( \zeta = 1 / (2 \Gamma) \), whereas the correct expression is \( \zeta = \arcsin(1 / \Gamma) \). Corrected versions of the figure and its caption are presented here. While this error led to an erroneous conclusion in the caption about the line-of-sight angles at which a jet of the given Lorentz factor would appear beamed to the observer, other conclusions made in the paper are not affected.

Moreover, a typesetting error led to the exponents of most of the \( \nu''_1 \) and \( \nu''_2 \) terms in equation (29) appearing incorrectly as subscripts. The exponents should have appeared as below.

\[
B''_{\text{min}} \propto \frac{\nu''_2^{1/2 + \alpha} - \nu''_1^{1/2 + \alpha}}{\nu''_1^{1/2 + \alpha} - \nu''_1^{1/2 + \alpha}} L''
\]  \hspace{1cm} (29)

I am grateful to D. Bahn for bringing these errors to my attention.

REFERENCE

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Figure 3. Visual appearance of a relativistic rod with features that are fixed in the object’s rest frame (i.e. one-dimensional blobs), for different line-of-sight angles $\theta$ and Lorentz factors. As in Fig. 1 of the original paper, the upper panel in each plot shows a ‘top view world map’, while the lower panel shows the appearance of the jet in a supersnapshot taken by an observer at $y = -\infty$. The solid bars above and below the jet in the upper panels indicate the fraction $1 - \beta \mu$ of the jet that is visible to the pole-on observer, above the jet for $\Gamma = 2$ (longer bar) and below the jet for $\Gamma = 10$. Those photons arriving at a projected position just next to the core were emitted by jet material adjacent to the inner end of the bar at the time when it was just next to the core. All parts of the jet that are closer to the core are not yet visible because the photons from those parts of the jet have not yet had time to reach the observer. The sectors at the ends of the solid bars indicate the relativistic beaming cone of half-opening angle $\zeta = \arcsin(1/\Gamma)$; for the angles and Lorentz factors shown here, the jets with $\Gamma = 2$ at angles $\theta \leq 30^\circ$ and that with $\Gamma = 10$ at $\theta = 5.7^\circ$ have their fluxes enhanced by beaming, while the remainder have their fluxes significantly suppressed by beaming.

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