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SCIENCE FICTION TO SCIENCE: KLT TO COMMUNICATE WITH STARSHOT AND TAU ZERO

**Abstract**

The relativistic KLT was firstly considered by this author as early as the 1990's when he derived the relevant full set of solving equations.

During the SETI 1 Session of the IAC 2019 held in Washington DC, Nicolò Antonietti and this author presented a paper extending for the first time their KLT calculations to the Friedmann-Lemaitre-Robertson-Walker (FLRW) metric of the expanding universe. It was also claimed that their new results could be of interest for SETI applications regarding incoming signals from relativistic spaceships, whether Human or Alien.

In the present paper the previous calculations are applied to the hyperbolic motion of a spaceship, i.e. the uniformly accelerated motion in the spaceship's reference frame. That is precisely the KLT for telecommunications between the Earth and a relativistic spaceship moving in the expanding universe from one stellar system to another one.

This being the case, the mathematics of the KLT for Starshot is described in detail in the present paper.

Finally, renowned Science Fiction author Poul Anderson (1926-2001) had already described the motion of such a relativistic interstellar spaceship in 1970 in his novel "Tau Zero".

Since Claudio Maccone had the honor to meet Poul Anderson in person at a conference back in the 1990's, this presentation is a tribute to him, just as a tribute to the whole current Starshot Team.