



Relativistic Physics for Teachers SS 2006

Problems 2 20.4.2006

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1. Constance of the speed of light c

Verify that under Lorentz-transformations the speed of light indeed is a constant.

2. Relativistic collision

A particle, the “projectile” with a given velocity v collides with another particle at rest, the “target”. There is a system S' where both particles, projectile and target, are moving with the same velocity v' towards each other, i.e. where $\vec{v}'_t = -\vec{v}'_p$ and $|\vec{v}'_t| = |\vec{v}'_p| = v'$. Calculate v' and specify for the case where v corresponds to a time dilation by a factor $\gamma = 3$ w.r.t. the target particle.