

Hyperbolic geometry, geometry of the Minkowski space, the Möbius transformations and the special theory of relativity

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Abstract. We review basic property of the flat geometry based on everyday intuition which is called Euclidean geometry (or parabolic geometry), and the non-Euclidean geometries which is called hyperbolic geometry (or Lobachevsky-Bolyai-Gauss geometry), and Minkowski geometry which is related Einstein's Postulate 2: The speed of light in vacuum is the same for all observers, regardless of the motion of light source or observer as well connections between these geometries.

In particular, we try to make a mathematical model motivated by the special theory of relativity, without using the second postulate of Einstein, and to consider it. We try to conclude that the two way speed of light is invariant.

Keywords: The Minkowski space; the special theory of relativity