

[Ergođdu, Melek; Özdemir, Mustafa](#)

On reflections and rotations in Minkowski 3-space. (English) [Zbl 1337.53036](#)

[J. Geom. Symmetry Phys.](#) 39, 1-16 (2015).

Summary: In this paper, we investigate the reflections in Minkowski three-space by three different approach. Firstly, we define Lorentzian reflections with Lorentzian inner product. Then, we examine Lorentzian reflections in view of Lorentzian Householder matrices. Finally, we use pure split quaternions to derive Lorentzian reflections. For each case, we find the matrix representation of Lorentzian reflections and characterize the plane of reflection by using this matrix representation. Moreover, we prove that any Lorentzian orthogonal transformation can be represented by the composition of at most six reflections.

MSC:

[53B30](#) Local differential geometry of Lorentz metrics, indefinite metrics

[15B10](#) Orthogonal matrices

[15A16](#) Matrix exponential and similar functions of matrices

Keywords:

[Minkowski space](#); [reflections](#); [rotations](#); [matrix representation](#)

Full Text: [DOI](#)