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Null Spatial Split Octonionic Curves

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Abstract

Split octonionic and spatial split octonionic valued functions of a single variable define curves in $\mathbb{R}^8_4$, the eight-dimensional Minkowski space of index 4. In [1], the authors used spatial split octonions to construct a new frame, called the G_2-frame, for non-null curves in $\mathbb{R}^7_4$. A key advantage of this frame is its computational simplicity and time efficiency compared to the classical Frenet frame. In this presentation, we examine the differential geometry of null curves in $\mathbb{R}^7_4$ using spatial split octonions. We construct a novel frame along these curves and derive the corresponding derivative formulas. Furthermore, we give symbolic computations for null spatial split octonionic curves with respect to this new frame.

Keywords Split Octonions · Null Curves · Symbolic Computations

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