

## On the Bishop frame of a partially null curve in Minkowski spacetime

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The Bishop frame  $\{T, N_1, N_2\}$  (relatively parallel adapted frame) of a regular curve in Euclidean space  $E^3$  contains the tangent vector field  $T$  of the curve and two relatively parallel vector fields  $N_1$  and  $N_2$  whose derivatives in arc length parameter  $s$  make minimal rotations along the curve. In Minkowski spaces  $E_1^3$  and  $E_1^4$ , the Bishop frame of a non-null curve and a null Cartan curve has analogous property.

In this talk, we present a method for obtaining the Bishop frame (rotation minimizing frame) of a partially null curve  $\alpha$  lying in the lightlike hyperplane of Minkowski spacetime. We show that  $\alpha$  has two possible Bishop frames, one of which coincides with its Frenet frame. By using spacetime geometric algebra, we derive the Darboux bivectors of Frenet and Bishop frame and give geometric interpretation of the Frenet and the Bishop curvatures in terms of areas obtained by projecting the Darboux bivector onto a spacelike or a lightlike plane.