

We propose a detail study of integral curves or flow lines of a linear vector field in Lorentz 3-space. We construct the matrix A depending on the causal characters of the vector x by analyzing the non-zero solutions of the equation $A(x)=0$, $x \in E^{3,1}$, in such a space, where A is the skew-symmetric matrix corresponding to the linear map A . Considering the structure of a linear vector field, we obtain the linear first-order system of differential equations. The solutions of this system of equations give rise to integral curves of linear vector fields from which we provide a classification of such curves.