

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.