

On the configurations of the singular points and their topological indices for the spatial quadratic polynomial differential systems

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Abstract

Using the Euler-Jacobi formula there is a relation between the singular points of a polynomial vector field and their topological indices. Using this formula we obtain the configuration of the singular points together with their topological indices for the polynomial differential systems $\dot{x} = P(x, y, z)$, $\dot{y} = Q(x, y, z)$, $\dot{z} = R(x, y, z)$ with degrees of P , Q and R equal to two when these systems have the maximum number of isolated singular points, i.e., 8 singular points. In other words we extend the well-known Berlinskii's Theorem for quadratic polynomial differential systems in the plane to the space.

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