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Abstracts of Short Communications and Posters

Section:

9. Ordinary Differential Equations
and Dynamical Systems

1991 MS Classification: 34C20, 34A26, 33E30
Bordag, Ljudmila A., Otto-von-Guericke-Universität Magdeburg, Germany:
Projective differential geometrical structure of the Painlevé equations.
The necessary and sufficient conditions that an equation of the form $y'' = f(x, y, y')$ can be reduced to one of the Painlevé equations under a general point transformation are obtained. The theory of invariants plays a leading role in this investigation. The reduction of all six Painlevé equations to the form $y'' = f(x, y)$ is obtained. The structure of equivalence classes is investigated for all the Painlevé equations.
Following Cartan the space of the normal projective connection which is uniquely associated with any class of equivalent equations is considered. The specific structure of the spaces under investigation allows to immerse them into $\mathbb{R}\mathbf{P}^3$. Each immersion generates a triple of two-dimensional manifolds in $\mathbb{R}\mathbf{P}^3$. The surfaces corresponding to all the Painlevé equations are presented.