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On the generalized Sundman transformations and integrable Li\{e\}nard-type equations

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In this talk we discuss applications of the generalized Sundman transformations for finding families of integrable Li\{e\}nard-type equations. Under integrable equations here we understand equations for which we can construct the general analytical solution. Employing connections, given by the generalized Sundman transformations, between Li\{e\}nard-type equations and equations of the Painleve–Gambier type we demonstrate a possibility of finding new integrable Li\{e\}nard-type equations. We consider connections between Li\{e\}nard-type equations and type I–III Painleve–Gambier equation. As a result, we obtain nine criteria for the integrability of the Li\{e\}nard-type equations. We also consider applications of this approach for finding autonomous Lagrangians, Jacobi multipliers and first integrals for Li\{e\}nard-type equations.

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