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On the Space-Time Monopole Equation: A Survey Talk

The Euclidean self-dual Yang Mills equations and their reduction to the Euclidean monopole equations are important equations in differential geometry. The self-dual Yang Mills equations can also be formulated in $\mathbb{R}^{2,2}$; equations with such signatures are not usually interesting in geometry. However, the reduction of the equation to a three-dimensional monopole equation with signature (2,1) yields a fascinating wave equation, which inherits the algebraic properties of an integrable system the Yang-Mills equations. We give a brief outline of geometric aspects of these equations and in particular discuss the scattering and inverse scattering theory.