

Gollek, H.

Bäcklund transformations, matrix-Riccati systems and isometric immersions of space forms into space forms. (English) [Zbl 0798.53057](#)

Szenthe, J. (ed.) et al., Differential geometry and its applications. Proceedings of a colloquium, held in Eger, Hungary, August 20-25, 1989, organized by the János Bolyai Mathematical Society. Amsterdam: North-Holland Publishing Company. Colloq. Math. Soc. János Bolyai. 56, 359-385 (1992).

Starting from a local group action of $Gl(2N, \mathbb{R})$ on the space of $N \times N$ -matrices the author introduces certain systems of partial differential equations and a Bäcklund transformation of the space of solutions. His investigation includes the generalized wave equation and the generalized sine-Gordon equation. A superposition formula is derived, which describes the commutativity of certain pairs of Bäcklund transformations. The method is applied to construct special maps into Grassmannian manifolds and particular isometric immersions of n -dimensional spaces of constant curvature into S^{2n-1} . In S^3 a special surface of revolution of constant curvature $K \in]0, 1[$ is obtained.

For the entire collection see [\[Zbl 0764.00002\]](#).

Reviewer: [H.Reckziegel \(Köln\)](#)

MSC:

[53C40](#) Global submanifolds

[35A30](#) Geometric theory, characteristics, transformations in context of PDEs

[58J72](#) Correspondences and other transformation methods (e.g., Lie-Bäcklund) for PDEs on manifolds

Cited in **2** Documents

Keywords:

[Bäcklund transformation](#); [wave equation](#); [sine-Gordon equation](#); [superposition](#); [Grassmannian manifolds](#)