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Ruled Surfaces Asymptotically Normalized

We consider a skew ruled surface Φ in the Euclidean space E^3 and relative normalizations of it, so that the relative normals at each point lie in the corresponding asymptotic plane of Φ. We call such relative normalizations and the resulting relative images of Φ asymptotic. We determine all ruled surfaces and the asymptotic normalizations of them, for which Φ is a relative sphere (proper or inproper) or the asymptotic image degenerates into a curve. Moreover we study the sequence of the ruled surfaces $\{\Psi_i\}_{i\in N}$, where Ψ_1 is an asymptotic image of Φ and Ψ_i, for $i \geq 2$, is an asymptotic image of Ψ_{i-1}. We conclude the paper by the study of various properties concerning some vector fields, which are related with Φ.

Keywords: Ruled surfaces, relative normalizations.

MSC: 53A25; 53A05, 53A15, 53A40