

Semidiscrete K-surfaces and Bäcklund transforms

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| TUE/EPCOS 15:30–15:50 |
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The asymptotic parametrizations of smooth surfaces with constant Gaussian curvature (K-surfaces) and their Bäcklund transforms constitute a famous chapter in 19th century surface theory [3]. Later, discrete K-surfaces were created by elementary means, and even with approximation properties still lacking, new light was shed on classical results [4]. The modern viewpoint is that the smooth theory is a limit of a discrete master theory, and both are embedded into the context of integrable systems [1,2]. In view of recent interest in *semidiscrete* surfaces, especially piecewise developable ones, we discuss semidiscrete instance of K-surfaces. Here, too, the discrete master theory applies. Nevertheless all constructions are elementary enough to be easily accessible in a direct way. We present K-surfaces, their transforms, and difference-differential equations of sine-Gordon type and Hirota type which are fulfilled by the angle functions associated with them.

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- [3] L. EISENHART, *A treatise on the differential geometry of curves and surfaces*, Dover 1909.
- [4] W. WUNDERLICH, Zur Differenzengeometrie der Flächen konstanter negativer Krümmung, *Sitz. Öst. Ak. Wiss.* **160** (1951), 41–77.