

LOCAL BASES FOR QUADRATIC DEFICIENT SPLINE SPACES
ON CRISS-CROSS TRIANGULATIONS

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In many practical applications, piecewise polynomial surfaces need to be connected by using different smoothness degrees and, in the literature, tensor product spline surfaces of such a kind have been widely investigated. Several problems can arise with tensor product surfaces, for example this choice may cause oscillations far from the shape to be built. Therefore, in some cases spline surfaces of total degree are preferable (see e.g. [1, 2]).

In [2], the authors presented the idea of quadratic spline spaces $\mathcal{S}_2^\mu(\mathcal{T}_{mn})$ with smoothness $\mu = 0, 1$, on criss-cross triangulations \mathcal{T}_{mn} of a rectangular domain, in order to construct NURBS surfaces. In this paper we continue the investigation of such spaces, introducing also the jump case, i.e. $\mu = -1$, with particular reference to the computation of their dimension and the construction and analysis of their local bases. Finally, we propose a computational procedure to construct such bases and we give some applications.

References

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- [2] R. H. Wang and C. J. Li, *A kind of multivariate NURBS surfaces*, J. Comp. Math., 22 (2004), pp. 137–144.