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The bivariate quadratic C^1 spline spaces with stable dimensions on the triangulations

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Abstract

The dimension is a basic problem in the theory of the bivariate spline space. In general, the dimension of the bivariate spline space defined on the triangulation is unstable or with singularity. In this paper, we consider the dimensions of the bivariate quadratic C^1 spline spaces defined on the triangulations. Our main result is when the degree of each interior vertex of the non-degenerate triangulation is at least 6, the dimension of the corresponding bivariate quadratic C^1 spline space is stable and equal to the number of the boundary vertices plus 3. We also give an example to show that the non-degenerate condition is necessary.

Keywords: Bivariate spline space, Dimension, Triangulation, Smoothing Cofactor Conformity method, Conformality condition

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