

# Quadratic Least-Squares Solution Reconstruction in a Boundary Layer Region

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## Abstract

A local weighted least-squares (LS) method is often used to approximate a solution function in computational aerodynamics problems. In our paper we study LS approximation by a quadratic polynomial on unstructured grids that have the high cell aspect ratio. It will be shown in the paper that a LS method degrades to unacceptable accuracy on stretched meshes and weighting of distant stencil points does not result in a more accurate reconstruction. A concept of numerically distant points will be employed to explain the reasons behind the method's poor performance and an approach will be discussed that allows one to improve the results of a quadratic LS reconstruction in a boundary layer region.