

# The Accuracy of Least-Squares Approximation on Highly Stretched Meshes

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## **Abstract**

A least-squares (LS) method is often used in computational aerodynamics to reconstruct a given function at certain points of a computational grid. In our paper we discuss the accuracy of the LS approximation on highly stretched meshes that are inherent in computational aerodynamics. A new definition of a distant point in a LS reconstruction stencil will be given in order to explain poor performance of the method in a boundary layer region. Namely, based on the concept of outliers widely used in the statistics, we demonstrate that the definition of a distant point in a LS reconstruction stencil should take into account the solution properties and it cannot rely upon geometric shape of the stencil only. Our approach is illustrated by numerical examples.