QUASI-INTERPOLATION IN SPLINE SPACES AND LOCAL APPROXIMATION ESTIMATES

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Abstract. The quasi-interpolation operators represent a practical and efficient method when calculating approximations using spline functions since they present a great simplicity and flexibility in their construction. To define them, B-splines bases are used and the coefficients are chosen locally, that is, each coefficient depends in general only on the data found in the support of the corresponding B-spline. The local form in which the coefficients for these operators are defined means that changes in the data or space of splines used have a low computational cost to recalculate the approximation, since it will change only locally. In this work we analyze Sobolev estimates for the approximation error using quasi-interpolants in spline spaces. We will establish in a general way the hypothesis about a quasi-interpolant to achieve the optimal orders of approximation. Finally, we propose simple but general quasi-interpolating constructions that satisfy the established hypotheses and we will compare experimentally the performance in the approximation for some of the proposed constructions.