1162-65-81 **Sergiy Borodachov*** (sborodachov@towson.edu), 7800 York Rd., Department of Mathematics, Towson University, Towson, MD 21252. *Optimal recovery of three times differentiable functions based on discrete data of smoothness two.*

We obtain an optimal multivariate spline recovery method for global reconstruction of functions from the Sobolev class $W^3_\infty(P)$ on a given d-dimensional convex polytope P. This optimal method uses as information functions values, gradients, and Hessians at a fixed finite point set $X \subset P$, which includes the vertices of P. We prove that this algorithm is optimal among all non-adaptive recovery methods. The recovery error is measured in the C-norm on P. This optimal method is a cubic continuous spline over a Delaunay triangulation X in P interpolating function values at points of X. We also construct a generalization of this recovery method for data of arbitrary smoothness $r-1$ and give its worst-case error bound over the Sobolev class $W^r_\infty(P)$. (Received August 24, 2020)