

**Prediction bounds for (higher order) total variation
regularized least squares**

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Abstract. This is joint work with Francesco Ortelli. We establish oracle inequalities for the least squares estimator \hat{f} with penalty on the total variation of \hat{f} or on its higher order differences. Our main tool is an interpolating vector that leads to lower bounds for compatibility constants. This allows one to show that for any $N \in \mathbb{N}$ the N^{th} order differences penalty leads to an estimator \hat{f} that can adapt to the number of jumps in the $(N - 1)^{\text{th}}$ order differences.