

Abstract: LASSO and SLOPE are two popular methods for dimensionality reduction in the high-dimensional regression. LASSO can eliminate redundant predictors by setting the corresponding regression coefficients to zero, while SLOPE can additionally identify clusters of variables with the same absolute values of regression coefficients. It is well known that LASSO Irrepresentability Condition is sufficient and necessary for the proper estimation of the sign of sufficiently large regression coefficients. In this article we formulate an analogous Irrepresentability Condition for SLOPE, which is sufficient and necessary for the proper ide

ntification of the SLOPE pattern, i.e. of the proper sign as well as of the proper ranking of the absolute values of individual regression coefficients, while proper ranking guarantees a proper clustering. We also provide asymptotic results on the strong consistency of pattern recovery by SLOPE when the number of columns in the random design matrix is fixed while the sample size diverges to infinity.

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