High-dimensional expectile regression with a possible change point

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Abstract: In this paper, we consider a high-dimensional expectile model with a possible change point due to a covariate threshold. We develop a SCAD-penalized estimator of both regression coefficients and the threshold parameter. The proposed estimator not only selects covariates but also selects a model between linear and threshold regression models. We establish the oracle property of the change point in the sense that its asymptotic distribution is the same as if the unknown active sets of regression coefficients were known. Numerical studies and an application to real data illustrate that the proposed method has satisfactory finite sample performance.