1128-90-297 **Hongbo Dong**, **Miju Ahn** and **Jong-Shi Pang***, jongship@usc.edu. *Structural properties of affine sparsity constraints.*

We introduce a new constraint system for sparse variable selection in statistical learning. Such a system arises when there are logical conditions on the sparsity of certain unknown model parameters that need to be incorporated into their selection process. Formally, extending a cardinality constraint, an affine sparsity constraint (ASC) is defined by a linear inequality with two sets of variables: one set of continuous variables and the other set represented by their nonzero patterns. This paper aims to study an ASC system consisting of finitely many affine sparsity constraints. We investigate a number of fundamental structural properties of the solution set of such a non-standard system of inequalities, including its closedness and the description of its closure, continuous approximations and their set convergence, and characterizations of its tangent cones for use in optimization. Our study lays a solid mathematical foundation for solving optimization problems involving these affine sparsity constraints through their continuous approximations. (Received February 28, 2017)