1112-13-62 **Michael R DiPasquale*** (mdipasq@okstate.edu), OSU-Mathematics, 401 MSCS Building, Stillwater, OK 74078. *A Chain Complex for Generalized Splines and Freeness of Graphic Multi-Arrangements.* Preliminary report.

Given a graph equipped with a labeling of its edges by ideals of a polynomial ring, the ring of generalized splines is the set of assignments of polynomials to the vertices such that polynomials corresponding to adjacent vertices are congruent modulo the ideal labeling the corresponding edge. For a graph equipped with such an edge-labeling, we introduce a chain complex in the spirit of Schenck-Stillman's complex for classical splines, whose first cohomology is the ring of generalized splines.

As an application, the module of derivations of a graphic multi-arrangement may naturally be interpreted as a ring of generalized splines on an appropriately labelled graph. We show that freeness of graphic multi-arrangements can be detected by the vanishing of the cohomologies of the associated chain complex. More generally, bounds on the projective dimension of the module of derivations of a graphic multi-arrangement may be obtained from the projective dimension of the cohomologies of this complex. (Received August 10, 2015)