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Chris S Peterson* (peterston@math.colostate.edu), Department of Mathematics, Colorado State University, Fort Collins, CO 80523. *Applications of homotopies in the space of sections of a sheaf.*

Given a polynomial system F , one may compute numerical approximations for all isolated solutions of F via homotopy continuation. This is accomplished by writing F as a member of a parametrized family of polynomial systems where one has known isolated solutions. Paths leading from the known solutions to the unknown solutions are then tracked by predictor/corrector methods. It can be of great advantage to have a smaller start system and this is one of the important features of polyhedral methods.

This talk will focus on instances where F can be written as the zero locus of a section of a sheaf such that the same sheaf has a regular section with known isolated zero loci. The Chern classes of the sheaf provide a bound on the number of isolated solutions and thus limit the size of the start system. Applications where a small start system can be used will be presented. (Received August 06, 2007)