1068-15-255 **Alessandro Arsie*** (alessnadro.arsie@utoledo.edu), University of Toledo, Department of Mathematics, MS 942, 2801 W. Bancroft St., Toledo, OH 43606, and **Christian Ebenbauer** (ce@ist.uni-stuttgart.de), University of Stuttgart, Institute for Systems Th. Automatic Control, Pfaffenwaldring 9, Room 2.244, 70550 Stuttgart, Germany. *Deformations of Lax equations, projections and applications.*

If $A(t)$ and $B(t)$ are $n \times n$ matrices with sufficiently smooth entries, it is well-known that equation in Lax pair form

$$\frac{d}{dt}A(t) = [A(t), B(t)] \tag{1}$$

defines isospectral deformations of A. In particular, all the k-moments I_k in the eigenvalues and all the elementary symmetric polynomials in the eigenvalues are also preserved under a Lax flow. It is therefore interesting to ask how to construct special deformations of Lax systems (**??**) in the form

$$\frac{d}{dt}A(t) = [A(t), B(t)] + Z_j(A(t)), \tag{2}$$

such that the resulting flow decreases or increases the j-th moment I_j, while at the same time preserving the other moments. In this talk we present two methods to construct such deformations and discuss some of their properties. We also discuss how to construct such deformations when one is interested to perturb the evolution of non-trivial conservation laws associated to specific Lax systems that appears to be completely integrable. In particular these methods allow to alter the Frobenius norm of a symmetric matrix, while keeping constant its trace and the other moments. Time permitting, relations to control systems and Poisson geometry will be highlighted. (Received January 19, 2011)