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**On explicit perturbation analysis of the Lanczos  
recursions and the Jacobi inverse eigenvalue problems**

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We obtain simple explicit formulas for the sensitivity of the Lanczos recursion to small perturbations of the spectrum. The sensitivity is computed as a quadratic form of the unperturbed eigenvectors. The derivation is based on a connection between Lanczos and discrete Gelfand-Levitan methods (described in an unpublished manuscript of Natterer, 1989). The formulas are valid for both symmetric and nonsymmetric problems. With the help of our analysis we show uniform stability of the symmetric Lanczos recursion and the Inverse Jacobi Eigenvalue Problems (in weak discrete norms) to the perturbations of the eigenvalues relative to their separations. This result is a byproduct of our analysis of optimal grids for variable coefficients.