The eigenvalue problem $A(p)u = \lambda u$ is studied for a family $A(p)$ of $n$-parametric real symmetric Hermitian matrices of dimension $m \times m$. Energy surfaces of eigenvalues are investigated under an arbitrary small perturbation $A(p) + \Delta A(p)$ in the neighborhood of the diabolic point $p_0$. General asymptotic formulas are derived describing the deformation of the energy surface near the conical singularity.

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Keywords: Hermitian matrices; eigenvalues; complex perturbations; diabolic point; singularity; bifurcation

Classification:
- 81Q15 Perturbation theories for operators and differential equations
- 47A57 Operator methods in interpolation, moment and extension problems
- 15A18 Eigenvalues of matrices, etc.