Symmetric Liapunov center theorem

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The aim of my talk is to present two versions of the Liapunov center theorem for symmetric potentials. Let $\Omega \subset \mathbb{R}^n$ be an open and invariant subset of an orthogonal representation $\mathbb{R}^n$ of a compact Lie group Γ with free Γ-action. If $\Gamma(q_0) \subset \Omega \cap (U')^{-1}(0)$ is a non-degenerate (i.e. $\dim \ker U''(q_0) = \dim \Gamma(q_0)$) or minimal orbit of critical points of Γ-invariant C^2-potential $U : \Omega \to \mathbb{R}$ and there is at least one positive eigenvalue of the Hessian $U''(q_0)$ then in any neighborhood of the orbit $\Gamma(q_0)$ there is a periodic orbit of non-stationary solutions of equation $\ddot{q}(t) = -U'(q(t))$. Moreover, we estimate the minimal period of these solutions.

The basic idea of the proof is to apply the infinite-dimensional version of the equivariant Conley index theory.