We consider a 2 d.o.f. Hamiltonian system with one degree of freedom corresponding to fast motion and the other corresponding to slow motion. The ratio of the time derivatives of the slow and fast variables is of order $\varepsilon << 1$. At frozen values of the slow variables, there is a separatrix on the phase plane of the fast variables, and there is a region in the phase space (the domain of separatrix crossings) where the projections of phase points onto the plane of the fast variables repeatedly cross the separatrix in the process of evolution of the slow variables. Under a certain symmetry condition, we prove the existence of many (of order $1/\varepsilon$) stable periodic trajectories in the domain of separatrix crossings. Each of these trajectories is surrounded by a stability island whose measure is estimated from below by a value of order $\varepsilon$. So, the total measure of the stability islands is estimated from below by a value independent of $\varepsilon$. We find an asymptotic formula for the number of stable periodic trajectories. As an example, we consider the problem of motion of a charged particle in the parabolic model of magnetic field in the Earth magnetotail. This is a work in collaboration with C. Simó, D. Treschev and A. Vasiliev.