Abstract. The limit as $\varepsilon \to 0$ of the value function of a singularly perturbed optimal control problem is characterized. Under general conditions it is shown that limit value functions exist, and solve in a viscosity sense a Hamilton-Jacobi equation. The Hamiltonian of this equation is generated by an infinite horizon optimization on the fast time scale. In particular, the limit Hamiltonian and the limit Hamilton-Jacobi equation are applicable in cases where the reduction of order, namely setting $\varepsilon = 0$, does not yield an optimal behaviour.

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