

73. Zvi Artstein and Vladimir Gaitsgory, **Linear-quadratic tracking of coupled slow and fast targets**. Math. Cont. Sign. Syst. 10 (1997), 1-30.

**Abstract.** The paper examines a singular perturbation model of tracking two targets, one slow and one fast which is assumed periodic. The plant is linear and the cost is quadratic. A limit problem is displayed. It corresponds to the limit behaviour of the perturbed system when the small parameter tends to zero. This limit is not of reduced order, as the fast target is periodic. Rather, an infinite horizon optimal averaging is performed on the fast scale, and serves as an input to the slow scale optimization. This limit design is used to approximate the optimal solution of the singularly perturbed system. Bounds for the rates of the approximation are given. The optimal limit design is computed in a feedback form in the general case, and for illustrative concrete examples.

For a copy of this paper send a request to [zvi.artstein@weizmann.ac.il](mailto:zvi.artstein@weizmann.ac.il).