SINGULAR STATE-DEPENDENT DELAY EQUATIONS: ASYMPTOTICS AND STABILITY

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In earlier work with Roger Nussbaum, we studied the limiting shape of solutions to singularly perturbed state-dependent delay equations, such as

$$\varepsilon \dot{x}(t) = f(x(t), x(t - r)), \qquad r = r(x(t)).$$

Here we extend this work, and study the detailed asymptotics of these solutions. Such an analysis is important in obtaining stability results, as well as results for problems with multiple delays. Techniques and ideas from geometric singular perturbations are used in our analysis.

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