On the homogeneous feedback stabilization: the role of resonances

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We will survey existing necessary conditions, and will provide new conditions based on resonance relations, for a homogeneous control system (w.r.t. a given dilation) to admit a homogeneous (of correct order), continuous, asymptotically stabilizing state feedback control. Such conditions are basic in utilizing high order, homogeneous, approximations of nonlinear systems to construct local asymptotically stabilizing feedback controls when linear approximations of the nonlinear system are not locally controllable.