## Lyapunov's Indirect (Linearization) Method

Using a Linearized system to evaluate the EP of a non-linear system

Lyapunov's linearization method shows that linear control design is a matter of consistency: one must design a controller such that the system remain in its "linear range". It also stresses major limitations of linear design: how large is the linear range? What is the extent of Stability (how large is $r$)?

If the linearized system is marginally stable, the Lyapunov's linearization method cannot assess the stability of the original nonlinear system.

These issues motivate a deeper approach to the nonlinear control problem, Lyapunov's Direct Method.