LaSalle’s Invariant Set Theorem

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Example-1

|  |  |
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|  |  |

Let us use total energy as the lyap-fcn

Divide by

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Let us use that lyap-fcn

Let us compute v-dot

By using

Q: is this term neg-def ? A: NO

Q: when does this term become zero ? A:

Let us look at the dynamics for that case then,

Q: when the dynamics have the form ? A:

Therefore, trajectories will converge to but they will not stay in that set unless

Example-2

Q: is the origin an A.S. eq.pt. of the system?

Let us use the typical quadratic lyap-fcn

Q: is this neg-def-fcn ? A: No

Q: when is this fcn zero? A:

|  |
| --- |
| case |
| Let us look at case, [what is the form of the dyns on that set]  Q: does the trajectory stay on ? NO, unless which would result in  Point being A.S. |
| case |
| Let us look at case, [what is the form of the dyns on that set]  Q: does the trajectory stay on ? NO, unless which would result in  Point being A.S.  On points, this becomes zero, but ,if we are looking at the neighborhood of the origin, we can say that this term becomes zero only when |