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Matrix-based techniques for (flow-)transition studies

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Propositions to accompany the dissertation

Matrix-based Techniques for (flow-)Transition Studies

Weiyan Song

1. Numerical bifurcation analysis of low-order flow models may yield relevant qualitative results on the behaviour of the solutions. However, to get both realistic qualitative and quantitative results one needs large-scale models.
2. For calculating steady solutions, pseudo-arclength continuation is to be preferred over time-marching approaches.
3. Efficient highly parallel preconditioners are crucial in the bifurcation analysis of large scale flow models.
4. There is no preconditioner suitable for every problem, like no pair of shoes fits everybody.
5. The Jacobi-Davidson method is the method of choice for stability study during continuation.
6. To create or improve an algorithm, idea is one thing, coding is another thing.
7. Though it seems we can choose at our life's transition points, where many branches occur, eventually, we follow our destiny just like a flow follows its equations.
8. Raising a child is a lifelong project.