Analysis of multiple solutions in bifurcation diagrams to avoid unexpected dynamics
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In mechanical applications it is essential that unexpected dynamics are avoided. The industry wants to build reliable machines that are not sensitive to initial conditions. Therefore, a simple method has been developed to extract all sets of stable bifurcation diagrams. The method gives a designer a good overview of possible dynamics and thereby the possibility to select a safe operating region. The method is described and demonstrated with a rub-impact rotor. The practical usage of this method is to help the designer to determine if parameter ranges exist where coexistent solutions will appear. Thereby one can design the system to work in parameter ranges where only one acceptable solution exists.

Keywords: Multiple solutions, dynamics, rub, impact, bifurcation diagrams.