

In the heavy shaft system, the damping ratio turns negative just below twice the critical speed. In the light shaft system, the damping ratios are smaller than in the heavy shaft. This means the light shaft system is more instable. These behaviors are well consistent with Figure 8.

7 Conclusion

In this paper, models are presented to describe the oil film force. Using our original rotating machinery library, it is possible to model a rotating machinery system supported by an oil film bearing. An example of Jeffcott rotor system supported by plain circular journal bearings is simulated and analyzed. The presented models make it possible to estimate Campbell diagrams and stability maps of the rotating machinery system by using the Modelica_LinearSystems2 as well as transient simulation results. The presented models show the abilities to design and diagnose rotating machinery systems.

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