Forced vibrations in geared shaft systems

Sorin Dumitru Musat & Doina Boazu
Dunarea de Jos University of Galati

ABSTRACT

In this paper a model of forced vibrations in geared shaft systems is proposed. This model transforms parametric self-excitation induced by variation of mesh stiffness of gears into an exterior excitation made by harmonical forces and couples. The present study concern geared shaft systems with spur gears.

Keywords: gear vibration, parametric vibration, vibrating systems modeling

5. References

1. **BAYO, E., SERNA**, M.A., 1989, *Penalty formulation for the dynamic analysis of elastic mechanisms*, Journal of Mechanisms, Transmissions and Automation in Design, 111, pp.321-327.
2**. BLAJER,W.**, 1992, *A projection method approach to consrained dynamic analysis,* ASME Journal of Applied Mechanics, 59, pp.643-649.
3**. BLAJER,W., BESTLE, D. and SCHIEHLEN, W**., 1994, *A projection method approach to constrained dynamic analysis*, ASME Journal of Mechanical Design , **116**, pp.423-428.
4. **BOLOTIN, W.W**., 1961, *Kinetische stabilitat elastischer systeme*, DVW, Berlin.
5. **OZGUVEN, H.N. AND HOUSER, D.R**., 1988, Dynamic analyses of high speed gears by using loaded static transmission error, Journal of Sound and Vibration, **125**, pp.71-83.
6. **OZGUVEN, H.N**., 1991, A non-linear mathematical model for dynamic analysis of spur gears including shaft and bearing dynamics, Journal of Sound and Vibration, **145**, pp.239-260.
7. **ŞENER, O.S. AND OZGUVEN, H.N**., 1993, Dynamic analysis of geared shaft systems by using a continuous system model, Journal of Sound and Vibration, **166,** 3, pp.539-556.
8. **UMEZAWA, K., AJIMA, T., HOUJOH, H**., *Vibration of three axes gear system,* Buletin of JSME, 27, 29,249, 1996, pp.590-597.
9. **UMEZAWA, K., SATO,T., ISHIKAWA, J**., *Simulation on rotational vibration of spur gear*, Buletin of JSME, 27, 223, 1984, pp.102-109.