

Optical-Thermal-Mechanical Analysis for Heat Assisted Magnetic Recording(HAMR)

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Abstract

The demand of the data storage continues increasing with the development of the big data, cloud computing technologies. Heat-assisted magnetic recording (HAMR) technology is the most promising technology for data storage to push the areal density up to 10 Tb/in². In HAMR, the laser heating system is integrated into the slider to heat the magnetic medium to its curie temperature about ~700 K for the Iron-platinum (FePt) media. In this paper, we establish an optical-thermal-mechanical model for analyzing the flying characteristics of HAMR by studying the touchdown process. The air conduction model and phonon conduction model are applied in our simulation. The non-isothermal MGL equation is implemented to solve the flying attitudes.

Figures used in the abstract

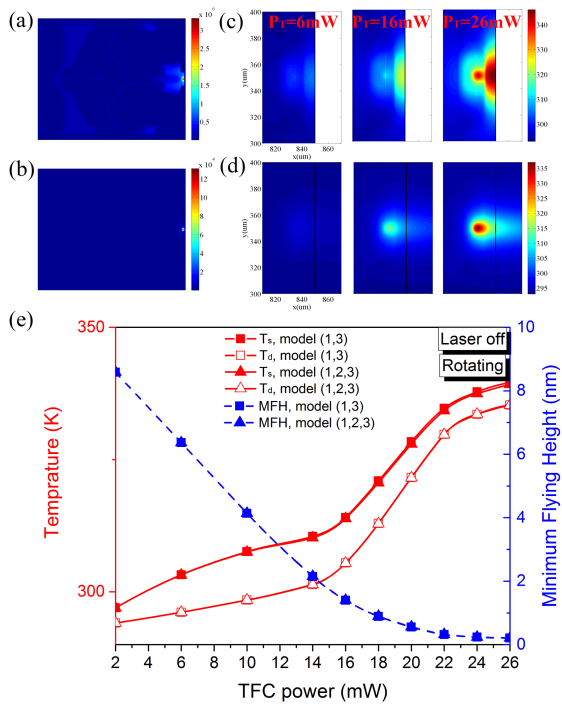


Figure 1: The touchdown processes of TFC case with four different HDI settings; (a) heat transfer coefficients of air conduction and (b) phonon conduction at TP=16 mW. (c) head surface temperature and (d) disk surface temperature distribution at the trailing edge.(e) parameters history during the touchdown process