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## **Feasibility of stress state assessment on the grounds of measurements of the residual magnetic field strength of ferromagnetics**

**Abstract.** The relations between stress and the values of the components of the residual magnetic field of ferromagnetic steels exposed to static and low-cycle loads were examined. For static loads the measurements of the strength of the residual magnetic field were shown under load and after unloading. For low-cycle loads, on the other hand, the impact of the number and the amplitude of changes in load were presented. It was concluded on the grounds of reference literature and the obtained results that the irreversible changes in magnetization, which result from loads, could be used as diagnostic signals. The tangential component which is parallel to the direction of tensile loads is characterized by a good correlation with stress. The fact that the value of the RMF increases significantly after field stress is exceeded makes it possible to work out a method to determine areas with plastic strain. The conclusions presented seem to be a good starting point for further and deeper studies and analyses whose aim is to employ the strength of the residual magnetic field to assess the stress state of machine and construction components.