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Study of parameters for designing Barkhausen noise sensing elements using finite element analysis NEELAM PRABHU GAUNKAR, ORFEAS KYPRIS, CAJETAN NLEBEDIM, DAVID JILES, Department of Electrical and Computer Engineering, Iowa State University — Barkhausen noise emissions occur in ferromagnetic materials on application of externally varying magnetic field. These emissions primarily occur due to the presence of pinning sites or discontinuities within the material which act as inhibitors to domain wall motion. The emissions can be sensed using an induction coil placed above the sample. This coil senses the variations in magnetic flux which translates to the induced emf. In this study, we optimize the design of the sensing coil via finite element simulations. The selection of optimum number of turns, choice of sensor core material and arrangement will be discussed. The approach to optimization of the sense-coil design will be presented.

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