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Feasibility Study on a Multi-pole Electro-magnet using Parallel Iron-core Structure

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This paper deals with a design concept of a multi-pole electro-magnet using parallel iron-core structure. The electro-magnets can be used in many kinds of magnetic study such as magnetic susceptibility, hall effect research, magneto-optical effect, and hysteresis measurement. In electro-magnets, generally, only a single probe can be applied at a time due to the single pole structure, and it is also very hard to measure many samples at a time. The present paper proposes multi-pole electro-magnet that has parallel iron-core structure unlike the conventional electro-magnet system. To verify the feasibility of the structure, a lab-scale multi-pole electro-magnet was designed using commercialized FEM software. Based on the design results, a parallel iron-core and coils assembly was fabricated, and the performance of magnet was evaluated with respect to the core structure.
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