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## Magnetoresistance of an insulating amorphous nickel-silicon film in large magnetic fields

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### Abstract

High magnetic field measurements for the magnetoresistance ratios  $R(B, T)/R(0, T)$  have been made on an insulating amorphous nickel-silicon thin film. In zero field, the resistance of this insulating film exhibits a “soft gap” variable-range hopping law in the liquid helium temperature region. In small fields, negative magnetoresistance values are observed, which can be explained using the forward interference (orbital momentum) theory. In intermediate and large fields, the magnetoresistance is positive and large and can be explained using the wave function shrinkage theory. A phenomenological model incorporating both processes gives very acceptable fits to the experimental data.



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## Keywords

Magnetoresistance; Insulating films; Electronic transport

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