

# Differential equations in modelling motion of dislocations

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We will present a mathematical model of motion of a screw dislocation in BCC metals, which was introduced in the paper

J. E. Dorn, S. Rajnak, Nucleation of kink pairs and the Peierls' mechanism of plastic deformation, *Trans. AIME* 230 (1964), 1052–1064.

We shall focus to derived differential equations from the mathematical point of view. In particular, we will discuss the problem on the existence of solutions to appropriate boundary value problems in the context of the so-called activated shape of a dislocation.