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A theoretical approach to combined hardening mechanisms in crystal plasticity

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Sala de Conferencias

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Hardening of polycrystals is often described by phenomenological models such as the one by Kocks and Mecking (KM). With the Taylor equation, it describes strain hardening in single-phased materials. Grain boundary and precipitation hardening are then included by adding empirical corrections. Here, the theoretical bases of KM-will be explored.

The Taylor equation is obtained from an evolution equation for shear stress as a function of dislocation density, which can be modified to include precipitates.

Dynamic annihilation and the grain size effect will be analysed from a probabilistic analysis of the slip length used in KM, to provide a theoretical basis for combined hardening mechanisms in alloys.

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