
Analysis of lattice distortions in high-carbon steels using EBSD

Grzegorz Cios^{*1}, Aimo Winkelmann², and Piotr Bala²

¹AGH University of Krakow, Academic Centre of Materials and Nano technology – Poland

²AGH University of Krakow, Academic Centre of Materials and Nano technology – Poland

Abstract

Fitting algorithms of dynamically simulated Kikuchi patterns to experimental ones has become increasingly important in recent years. Methods called dictionary indexing or pattern matching have migrated to commercial products.

Whereas most approaches used so far assume no elastic strain in experimental and simulated patterns, we present how dynamically simulated and on-flight distorted patterns can be fitted to high-carbon steel tetragonal martensite.

During the presentation, the tetragonality of the martensite in high-carbon steels will be introduced together with the pattern-matching methodology of tetragonality measurement with EBSD. Finally, successful c/a ratio mapping will be presented with a critical analysis of the results.

Keywords: EBSD, martensite

*Speaker