Dr. Ilana Timokhina is a Senior Research Academic of Institute for Frontier Materials, GTP Research, at Deakin University. In 1989 she received her Master degree from Kharkov University, Ukraine and, in 2002, she received her PhD from the Institute for Frontier Materials, Deakin University, Australia.

He is the author of over 100 peer-reviewed scientific papers.

Dr Timokhina has 5 years’ experience in the semiconductor thin films area and over 15 years’ experience in engineering research. This has involved conceiving and managing research programs of various degrees of complexity. She has significant experience in discovering the structure-property relationships in metals, predominantly in steels such as martensitic, TRIP, Dual Phase, NANO, advanced HSLA, TWIP, QP and High Strength bainitic steels and Al, Mg and Ti alloys utilizing Transmission and Scanning Electron microscopy, Atom Probe Field Ion Microscopy, X-Ray analysis and mechanical testing, small punch testing etc. as her main research tools. Over the past decade the main focus of Dr Timokhina research has been microstructural characterization of High Strength Low Alloy Steels after thermomechanical processing and intercritical annealing and also after additional heat-treatment for the automotive industry. She also has significant experience in microstructural characterization of nano-size features such as the dislocation structure, formation of Cottrell atmospheres and cluster formation, solutes redistribution. Dr Timokhina has experience in texture analysis of metals after hot rolling, warm rolling and room temperature Equal Channel angular extrusion.
The development of modern steels is based on the tailoring of the microstructure to achieve the required properties. While historically this was performed at the micrometer scale length there is now the scope to undertake this at the nanoscale or atom scale. The presentation will review recent work related to the development of ultrafine and nanoscale microstructures in TWIP, TRIP and bainitic steels as well as changes at shorter scale lengths, such as cluster formation and solute effects. This includes the development of precipitation and cluster strengthening, nano-scale and ultrafine bainite, bake hardening of steels and nano-twinning. A key element of this work has been the use of combination of transmission electron microscopy and atom probe tomography to unlock the nature of these structures.
Hossein Beladi obtained his B.Sc. in Metallurgy and Materials Engineering from Sharif University of Technology, Iran in 1994 and M.Sc. in Materials Engineering from University of Tehran, Iran in 1997. Afterwards, he worked in an automotive industry for three years before joining Deakin University, Australia in 2001 to do his Ph.D. on “ultrafine ferrite grained structure formation in steels through thermomechanical processing”. He was awarded his Ph.D. in 2005. He was then employed as a research fellow at Deakin University and promoted to a senior research academic position in January 2011. He has published more than 60 papers in the high-ranking international journals. His current research interest mainly focuses on the structure and properties of grain boundaries/interfaces in steels and how they influence the mechanical behaviour.
The Intervariant Crystallographic Plane Character

Distribution in a Lath Martensite

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Abstract

The closest orientation relationship and the distribution of intervariant boundary character in a lath martensitic microstructure were computed using electron backscatter diffraction analysis technique. Based on orientation mapping of a lath martensite microstructure formed from austenite, the Kurdjumov-Sachs orientation relationship provides the best explanation for the variants that formed in the majority of the prior austenite grains. The intervariant interface/boundary character distribution in the lath martensite revealed a relatively high anisotropy, mostly terminating on (110) planes. This results from the crystallographic constraints associated with the shear transformation rather than from a low energy interface configuration. The habit planes of lath martensite were shown to be mostly (110) or near (110) planes. The distribution of intervariant interfaces with the misorientation axis of [111] and [110] are mostly centred on {110} symmetric tilt and {110} twist positions, respectively.