

# Innovative advancements in the FEM simulation applied to laser welding and resistance spot welding of automotive components

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## ABSTRACT

In this paper, we present the recent improvements regarding the finite element modeling of welding techniques: - laser welding and - resistance spot welding. Transvalor company works since several years in collaboration with academic and industrial partners in order to develop an innovative FEM software so-called TRANSWELD® which is able to simulate not only the standard thermal-mechanical phenomena but also the in-depth metallurgical effects occurring during welding. A specific focus will be also given to the self-adaptive remeshing capability used in the software that allows a very precise level of accuracy in the welded areas. Various industrial applications will be presented including the weldability of dissimilar steel sheets and the laser welding of automotive components with comparison between simulation results and experiments.

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