

Helmet optimisation based on head-helmet modelling.

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Abstract

Helmet optimisation based on head-helmet modelling C. Deck, R. Willinger & D. Baumgartner
University of Strasbourg - UMR 7507 ULP-CNRS, France. Abstract The aim of this work is to optimise a full face helmet finite element model based on the dynamic behaviour of its components against biomechanical criteria. It is well known that helmets substantially reduce head injury, although the mechanism of this protection is neither well understood nor controlled. Moreover, today helmets are designed to reduce headform deceleration and not optimised to reduce head injury. The helmet used in this study is a full face helmet with a polycarbonate thermoplastic shell and an expanded polystyrene foam, certified to BS6658A [1]. The validation of the helmet FEM corresponds to the impact test stipulated by the British Standard BS 6658A, and the ECER022104 [2]. After a validation with a headform FE model as used in the experimental normative tests, the helmet model was coupled with a previously developed finite

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