

# Biomechanical Modelling of a Golf Swing by Means of the Multibody-Kinetics Software “ADAMS”

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## Abstract

Previous double pendulum models of the golf swing could have included some over-simplifications (only two model segments, 2D analysis of 3D motion, rotation around a fixed pivot point). This has been overcome by full-body models driven by motion capture data from real swings. However, information regarding the validity of these models is still limited. Therefore, the aim of this study was to create and to validate a full-body model of the golf swing. A Vicon motion analysis system (12 cameras,  $f=250$  Hz) was used to record one subject performing a golf swing with a driver club. By applying the software ADAMS with its plug-in LifeMOD, a full-body simulation of the swing was created based on the recorded motion. Ground reaction forces and the trajectory of the club head were not used as model inputs, but served as independent validation parameters instead. Comparison of the experimental data with the model outputs showed general agreement and a promising potential of the model. In conclusion, it was shown that the software ADAMS with its LifeMOD plug-in is an efficient tool to create biomechanical models of golf swings. Future models should include the shaft deformation and an impact function.

KEYWORDS: BIOMECHANICAL MODELING, GOLF SWING, VALIDATION