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Sommario/riassunto

The emergence of electric drives opens up new opportunities in vehicle design. For example, powerful in-wheel motors pro -vide unprecedented flexibility in chassis design and are suitable for distributed drive solutions, although implying non-trivial vehicle dynamics control problems. This work aims at a new differential steering concept relying only on passive steering linkages where the necessary steering moment about the kingpins is generated by traction force differences produced by in-wheel motors. For the analysis of the proposed steering concept, a tailored multi-body system model is introduced along with the associated steering control system. In addition, this work explores the general applicability of such a new steering concept by using multi-objective optimisation. For this purpose, various design objectives and constraints are defined with respect to the dynamic, steady-state and low-speed steering performance of the vehicle. The resulting behaviour of the proposed steering concept is investigated by various simulation experiments demonstrating a comparable steering performance to that of conventional passenger cars.