Extension of the FundamentalWave Library towards Multi Phase Electric Machine Models

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Electric machine theory and electric machine simulations models are often limited to three phases. Up to the Modelica Standard Library (MSL) version 3.2 the provided machine models were limited to three phases. Particularly for large industrial drives and for redundancy reasons in electric vehicles and aircrafts multi phase electric machines are demanded. In the MSL 3.2.1 an extension of the existing FundamentalWave library has been performed to cope with phase numbers greater than or equal to three. The developed machine models are fully incorporating the multi phase electric, magnetic, rotational and thermal domain. In this publication the theoretical background of the machines models, Modelica implementation details, the parametrization of the models and simulation examples are presented.