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Advanced Electric Motor Design Using Hollow Conductors for Maximizing Power, Density and Degree of Efficiency

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Abstract : The use of hollow conductors is known in electric generators of large MW scale. The application of motors of small scale between 50 and 200kW is new. The latest results in the practical application and set up of machines show that the power density can be raised significantly and the common problem of derating of the motors is prevented. Furthermore, new design dimensions can be realised as continuous current densities up to 75A/mm² are achievable. This paper shows the results of the application of hollow conductors for a motor design used for automotive traction machines comparing common coolings with hollow conductor cooling.

Keywords : degree of efficiency, electric motor design, hollow conductors, power density
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