

HTS High-dynamic Electrical Motors

K. L. Kovalev^{1,3}, D. S. Dezhin¹, L. K. Kovalev¹, V. N. Poltavets¹, R. I. Ilyasov¹,
D. S. Golovanov¹, B. Oswald², K.-J. Best², W. Gawalek³

¹Moscow Aviation Institute, Moscow, Russia

²Oswald Elektromotoren GmbH, Miltenberg, Germany

³Institute of Photonic Technology, Jena, Germany

E-mail: klink@mail.ru

Abstract - The application of bulk HTS elements in the electrical machines allows to improve their output parameters. In the presented article HTS high-dynamic electrical motors with excitation from permanent magnets (PM) and bulk HTS elements in the rotor are considered. The analysis of parameters of such HTS motors with radial, tangential and Halbach array arrangements of PM was carried out. The influence of bulk HTS elements on their output characteristics is investigated. It was shown theoretically and experimentally, that application of HTS bulks together with PM allows to improve the output characteristics of the motors with PM. The experimental synchronous HTS motors with bulk HTS elements and PM and high dynamics were designed and manufactured. The experimental investigations of these motors were carried out and are in good agreement with theoretically results. This HTS motor was developed for usage as the drive for cryogenic pumps of hydrogen power lines.

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