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THE PLASMA GENERATION ON COPPER AND DURALUMIN CONDUCTORS COATED WITH MOLYBDENUM OR BISMUTH *

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The use of a double-layer structure of a conductor with an outer layer up to 100 μm thick, obtained by vacuum deposition, which has a lower conductivity, leads to a delay in the onset of plasma generation on its surface compared to a homogeneous conductor in fields with a maximum magnetic field induction of 200÷400 T [1,2]. In addition, the outer layer suppresses the development of plasma instabilities comparing to a homogeneous conductor [3]. Titanium or zirconium was usually used as the outer layer, and the main conductor was made of copper or duralumin.

Assuming such parameters as conductivity and mass of the ion of molybdenum and bismuth, these materials look quite promising. But the experiments on the MIG generator (current amplitude up to 2.5 MA, rise time 100 ns) show that the use of molybdenum and bismuth as the outer layer of double-layer conductors does not improve the results comparing to titanium and zirconium. Thus, when choosing a material of deposition as the outer layer for double-layer conductors, one should take into account both the features of the materials themselves and the methods of their deposition: adhesion, increased stresses in the material, the complexity of deposition of "thick" layers of tens of microns, etc.

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