A complementary metal-oxide-semiconductor compatible monocantilever 12-point probe for conductivity measurements on the nanoscale

We present a complementary metal-oxide-semiconductor compatible, nanoscale 12-point-probe based on TiW electrodes placed on a SiO2 monocantilever. Probes are mass fabricated on Si wafers by a combination of electron beam and UV lithography, realizing TiW electrode tips with a width down to 250 nm and a probe pitch of 500 nm. In-air four-point measurements have been performed on indium tin oxide, ruthenium, and titanium-tungsten, showing good agreement with values obtained by other four-point probes. In-vacuum four-point resistance measurements have been performed on clean Bi(111) using different probe spacings. The results show the expected behavior for bulk Bi, indicating that the contribution of electronic surface states to the transport properties is very small. (C) 2008 American Institute of Physics.

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