

Experimental data obtained from polycrystalline microstructure can be in certain situations viewed as a realization of a random field or as a realization of a random marked tessellation with marks such as grain volume or grain orientation. A natural question is, whether there are dependencies within the random field or whether the marks are assigned to each grain independently on the tessellation. In this work characteristics quantifying measure of spatial dependence between marks are presented and based on them non-parametric tests of independent marking of a tessellation are proposed. We investigate power of the tests on newly introduced models of dependently marked tessellations with marks from space representing grain orientation. Proposed methods are applied on real data of microstructure with cubic crystal lattice.