STEREOLOGICAL FORMULAE FOR SIZE DISTRIBUTIONS VIA MARKED POINT PROCESSES

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Abstract: This paper deals with the intersection of a non-random k-dimensional flat with a subset of R^d which is the union of infinitely many particles. It is described by a stationary marked point process Φ, where the $points$ are the positions and the $marks$ determine the forms of particles. Then the intersection set can be described similarly by a stationary marked point process Ψ. The intensity and the Palm mark distribution of Ψ can be expressed in terms of the corresponding characteristics of Φ. The formulae generalize well-known formulae for the Boolean model (i.e. independently marked Poisson process) to a quite general case. Furthermore, they are similar or equivalent to those for cross-sections of compact sets by Poisson flat processes. Since the formulae connect k-dimensional characteristics with d-dimensional ones, they are of stereological interest.

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