

THE THEORY OF 3D POLARIZATION AND ITS APPLICATION IN SMOLM

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In this talk we discuss extensions to the standard polarization formalism for situations in which all three Cartesian components of the electric field vector are significant. Standard concepts for paraxial polarization such as the degree of polarization, the Stokes parameters, and the Poincaré sphere then have generalizations that are neither unique nor trivial. It is shown that this formalism is particularly useful for the description of wobbling fluorophores in single molecule orientation and localization microscopy (SMOLM).

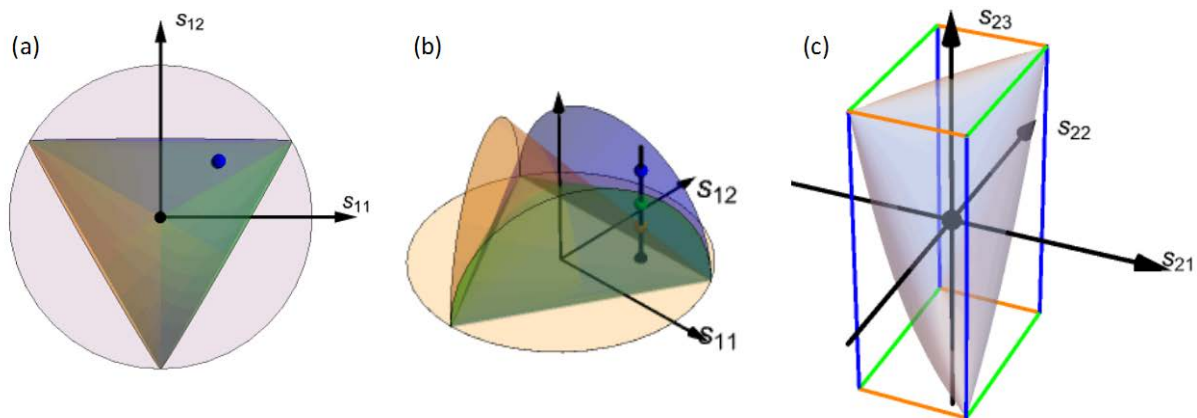


Fig. 1: Inhabitable regions for the five of the eight Stokes parameters used both in 3D polarization and for the description of fluorophore orientation and wobble statistics.