It is shown that, for an incoherent superposition of the orthogonally polarized laser beams, the vector singularities of a specific type arise at the transversal cross section of a paraxial combined beam instead of common singularities, such as amplitude zeros or optical vortices (inherent in scalar, i.e. homogeneously polarized, fields), and C points, where polarization is circular, and L lines, along which polarization is linear (inherent in completely coherent vector, i.e. inhomogeneously polarized fields). There are U lines (closed or closing at infinity) along which the degree of polarization equals zero and the state of polarization is undetermined, and isolated P points where the degree of polarization equals unity and the state of polarization is determined by the non-vanishing component of the combined beam. U surfaces and P lines correspond to such singularities in three dimensions, by analogy with L surfaces and C lines in three-dimensional completely coherent vector fields. P lines directly reflect the snake-like distortions of a wavefront of the singular component of the combined beam. Crossing of the U line (surface) is accompanied by a step-like change of the state of polarization onto the orthogonal one. U and P singularities are adequately described in terms of the complex degree of polarization with the representation at the Stokes space, namely at and inside of the Poincar´e sphere. The conditions of topological stability of U and P singularities are discussed, as well as the peculiarities of the spatial distribution of the degree of polarization in the closest vicinity to such singularities. Experimental examples of reconstruction of the combined beam's vector skeleton formed by U and P singularities as the extrema of the complex degree of polarization are given. Comparison with the related investigations is provided.
Keywords: optical singularities, partial polarization, partial coherence, Stokes polarimetry

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