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Wolfgang Wieland: Twistorial phase space for complex Ashtekar variables

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We generalise the $SU(2)$ spinor framework of twisted geometries developed by Dupuis, Freidel, Livine, Speziale and Tambornino to the Lorentzian case, that is the group $SL(2, \mathbb{C})$. We show that the phase space for complex valued Ashtekar variables on a spinnetwork graph can be decomposed in terms of twistorial variables. To every link there are two twistors—one to each boundary point—attached. The formalism provides a new derivation of the solution space of the simplicity constraints of loop quantum gravity. Key properties of the EPRL spinfoam model are perfectly recovered.