Flags and Twistors

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In this talk, I will present some first results on the geometry of the flag manifold $\mathbb{F}$ as twistor space of the complex projective plane. Firstly, I will present some general facts on low-degree curves and surfaces in the flag manifold. Afterward, I will introduce the twistor fibration associated with the standard Hermitian metric in $\mathbb{CP}^2$ and describe the set of twistor fibers. In the second part, I will give a description of the family of automorphisms of $\mathbb{F}$ that come from unitary automorphisms of $\mathbb{CP}^2$ and I will show a classification result for a family of algebraic surfaces in $\mathbb{F}$, up to such transformations. For a special sub-family of these surfaces, namely those which are j-invariant, I will give a deeper geometric description.