In his work on symplectic Lefschetz pencils, Donaldson introduced the notion of estimated transversality for a sequence of sections of a bundle. Together with asymptotic holomorphicity, it is the key ingredient allowing the construction of symplectic submanifolds. Despite its importance in the area, estimated transversality has remained a mysterious property.

In this talk our aim is to shed some light into this notion by studying it in the simplest possible case namely that of $S^2$. We state some new results about high degree rational maps on the 2-sphere that can be seen as consequences of Donaldson’s existence theorem for pencils, and explain how one might go about answering a question of Donalson: what is the best estimate for transversality that can be obtained? We also show how the methods applied to $S^2$ can be further generalized.

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