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Filaments interact in space by "tangling". The physical properties of a polymer or other filament system are strongly influenced by the amount and nature of the tangling. But the word "tangling" is intuitive: there is no one perfect definition.

Earlier experiments and theoretical analyses have used topological knot type and crossing number. Topological knot type can under-estimate tangling by ignoring highly tangled unknots. And counting crossing numbers (or writhe) can over-estimate tangling by giving full weight to neat coils.

In this talk, we propose and compare several quantitative measures designed to more closely capture the intuitive notion of "tangling". (Received August 21, 2006)