Linked and Knotted Gravitational Radiation AMY THOMPSON, UC Santa Barbara, JOE SWEARNGIN, UC Los Angeles, DIRK BOUWMEESTER, UC Santa Barbara — It is well known that in electromagnetism there exist solutions with linked and knotted field lines. In particular, the electromagnetic hopfion is a null solution such that any two field lines corresponding to either the electric, magnetic, or Poynting vector fields are closed and linked exactly once. Previously we showed that using twistor methods one can construct the electromagnetic hopfion and the analogous linearized gravitational field. In the case of gravity the topological structure manifests in the tendex and vortex lines, the analog of the electromagnetic field lines, so that each set of integral curves also has linking number one. We now show that these solutions are the simplest case in a class of topologically non-trivial solutions. Reparameterizing the twistor elementary states in terms of the winding numbers of the field lines allows one to choose the degree of linking or knotting of the associated field configuration. We will discuss the properties of these solutions and the effect of the topology on the time evolution of the gravitational fields.