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*Tensor product surfaces and linear syzygies.*

A tensor product surface is the image of a map  $\varphi : \mathbb{P}^1 \times \mathbb{P}^1 \rightarrow \mathbb{P}^3$ . Such surfaces arise in geometric modeling and it is often useful to find the implicit equation for the surface. In this poster we explain how the implicit equation can be obtained from the syzygies of the defining polynomials of the map via an approximation complex. In particular, the existence of a linear syzygy allows for a straightforward description of the implicit equation of the image from which we can describe part of the codimension 1 singular locus. This is joint work with Hal Schenck. (Received September 10, 2015)