

On threefolds with hyperplane section an elliptic surface

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We study threefolds in a projective space having as hyperplane section a smooth surface with an elliptic fibration. We first give a general theorem about the possible embeddings of such surfaces with Picard number two. Note that, in many cases, these threefolds are Mori fiber spaces. More precise results are then proved for Weierstrass fibrations, both of rank two and higher. In particular we prove that a Weierstrass fibration of rank two that is not a K3 surface is not hyperplane section of a locally complete intersection threefold. Moreover we give some conditions, for many embeddings of Weierstrass fibrations of any rank, under which every such threefold must be a cone.