

Geometry, Physics, and Representation Theory
Northeastern University

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**On the double EPW sextic associated to a
Gushel-Mukai fourfold.**

Abstract

A GM fourfold is a smooth dimensionally transverse intersection of the cone over the Grassmannian $\text{Gr}(2, 5)$ with a quadric hypersurface in a eight-dimensional linear space over \mathbb{C} . These Fano fourfolds have a lot of similarities with cubic fourfolds. Debarre and Kuznetsov constructed an associated EPW sextic hypersurface, whose double cover, when smooth, is a hyperkähler fourfold deformation equivalent to the Hilbert square of a K3 surface.

The aim of this talk is to study the double EPW sextic associated to a GM fourfold as a moduli space of (twisted) stable sheaves on a K3 surface, as done by Addington for the Fano variety of lines of a cubic fourfold. To this end, we discuss the problem of characterizing Hodge-special GM fourfolds with an associated K3 surface in terms of their Mukai lattice. Then we prove a necessary and sufficient condition in order to have the double EPW sextic birational to the Hilbert square of a K3 surface.