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Homogeneous spaces and del Pezzo surfaces

In a joint work with Vera Serganova we apply representation theory to prove a generalized conjecture of Victor Batyrev. Let X be a smooth del Pezzo surface (not necessarily split), and G be the simply connected simple Lie group with root system of the same type as that attached to X , i.e. one of A_4 , D_5 , E_6 , E_7 . We give sufficient conditions under which a universal torsor over X embeds into a twisted form of a generalized Grassmannian G/P , equivariantly with respect to the action of a maximal torus of G .