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Arzu Boysal* (boysal@email.unc.edu), Dept. of Mathematics, University of North Carolina at Chapel Hill, CB #3250 Phillips Hall, Chapel Hill, NC 27599, and **Shrawan Kumar**. *Explicit determination of the Picard group of moduli spaces of semistable G -bundles over algebraic curves.*

Let \mathcal{C}_g be a smooth projective irreducible algebraic curve over \mathbb{C} with genus $g \geq 1$ and let G be a connected, simply connected, simple affine algebraic group.

Under the above assumptions we will determine the Picard group of the moduli spaces of semistable principal G -bundles over \mathcal{C}_g , $\text{Pic}(\mathfrak{M}_{\mathcal{C}_g}(G))$, explicitly. It was known that $\text{Pic}(\mathfrak{M}_{\mathcal{C}_g}(G))$ is isomorphic to \mathbb{Z} , however the precise form of all the algebraic line bundles over $\mathfrak{M}_{\mathcal{C}_g}(G)$ was not known for nonclassical G excluding G_2 .

In this paper, we show that theta bundles $\Theta_V(\mathcal{C}_g, G)$, where V runs over all the finite dimensional representations of G , generate $\text{Pic}(\mathfrak{M}_{\mathcal{C}_g}(G))$. Moreover, we show that there is a fundamental weight ω_d of G such that the theta bundle $\Theta_{V(\omega_d)}(\mathcal{C}_g, G)$ corresponding to the irreducible highest weight G -module $V(\omega_d)$ with highest weight ω_d generates $\text{Pic}(\mathfrak{M}_{\mathcal{C}_g}(G))$. These distinguished fundamental weights correspond to fundamental weights with minimum Dynkin index. (Received July 05, 2005)