1056-51-634   **Prim Plansangkate***, Centre de recherches mathématiques, Université de Montréal, P.O. Box 6128, Centre-ville Station, Montréal (Québec), H3C 3J7, Canada. *Affine sphere equation, Hitchin system and Painleve III.*

We give a gauge invariant characterisation of the symmetry reduction from the anti-self-dual Yang-Mills system on R^4 with gauge group $SU(2,1)$ to the affine sphere equation

$$\psi_{z\bar{z}} + \frac{1}{2}e^{\psi} + |U|^2 e^{-2\psi} = 0, \quad U_{\bar{z}} = 0,$$

which arises in the context of Strominger-Yau-Zaslow conjecture in mirror symmetry. The radially symmetric solutions of the affine sphere equation are characterised by solutions of the Painleve III equation with special values of parameters. (Received September 15, 2009)