1040-22-33 **Shrawan Kumar*** (shrawan@email.unc.edu), Department of Mathematics, UNC at Chapel Hill, Chapel Hill, NC 27599-3250. *On Cachazo-Douglas-Seiberg-Witten Conjecture for Simple Lie Algebras.*

Let g be a finite dimensional simple Lie algebra over the complex numbers. Consider the exterior algebra $R := \wedge(g \oplus g)$. There are three 'standard' copies of the adjoint representation g in the degree 2 component R^2.

Let J be the ideal of R generated by the three copies C_1, C_2, C_3 of g and define the g-algebra $A := R/J$. The Killing form gives rise to a g-invariant $S \in A^{1,1}$.

Cachazo-Douglas-Seiberg-Witten made the following conjecture.

Conjecture (i) The subalgebra A^g is generated by the element S.

(ii) $S^h = 0$, where h is the dual Coxeter number of g.

(iii) $S^{h-1} \neq 0$.

The aim of this talk is to give a uniform proof of the above conjecture part (i).

The main ingredients in the proof are: Garland's result on the Lie algebra cohomology of $\hat{g} := g \otimes t\mathbb{C}[t]$; Kostant's result on the 'diagonal' cohomolgy of $\hat{g}$ and its connection with abelian ideals in a Borel subalgebra of g; and a certain deformation of the singular cohomology of the infinite Grassmannian introduced by Belkale-Kumar. (Received January 8, 2008)