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Ian Hambleton*, Department of Mathematics & Statistics, McMaster University, Hamilton, ON L8S 4K1, Canada. *Gauge theory and smooth group actions on 4-manifolds*. Preliminary report.

We will discuss an equivariant version of the Yang-Mills moduli spaces of ASD connections over a smooth 4-manifold, and previous applications of these moduli spaces to study smooth finite group actions on 4-manifolds (joint with Ronnie Lee). Work in progress concerns two problems (i) finding a bound on the orders of cyclic groups which can act smoothly on a K3 surface, and (ii) showing that a smooth odd order cyclic group action on $S^2 \times S^2$ has standard rotation numbers. (Received June 22, 2011)