

1077-35-2216

**Leonard Gross\*** ([gross@math.cornell.edu](mailto:gross@math.cornell.edu)), Department of Mathematics, Cornell University, Ithaca, NY 14853. *Yang-Mills heat equation with  $H_{1/2}$  initial data in three dimensions*. Preliminary report.

It is known that the Yang-Mills heat equation over a bounded open set in  $\mathbb{R}^3$  with smooth boundary has long time solutions for Dirichlet, Neumann or Marini boundary conditions when the initial connection form is in Sobolev class  $H_1$ .

In this talk it will be shown how to extend the initial data space to Sobolev class  $H_{1/2}$ . The resulting solution space is then an infinite dimensional complete Riemannian manifold of class at least  $C^2$ .

Continuous dependence of the solution on the initial data is established. Three spatial dimensions is the critical dimension for  $H_{1/2}$  initial data. (Received September 21, 2011)