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Christine M Guenther* (guenther@pacificu.edu), Department of Mathematics and Computer Scienc, 2043 College Way, Pacific University, Forest Grove, OR 97116. Some preliminary results on the second order renormalization group flow. Preliminary report.

The geometric evolution equation

$$\frac{\partial g}{\partial t} = -2Rc - \frac{\alpha}{2}Rm^2$$

arises as the second order renormalization group flow of quantum field theory. (Here g is a Riemannian metric, Rc is the Ricci curvature tensor, $Rm_{ij} = g^{rs}g^{mn}g^{kl}R_{irmk}R_{jsnl}$, and $\alpha << 1$ is a parameter.) It has been of interest to physicists, but as yet little is known about it mathematically. In this talk we will present a basic introduction to the equation, and some preliminary results obtained by geometric analytical methods. (Received August 24, 2009)