1086-53-651   **Guoyi Xu*** (`guoyixu@math.uci.edu`), 340 Rowland Hall, University of California, Irvine, Irvine, CA 92697. *Short time asymptotic behavior of the logarithm of heat kernel.*

Let (M^n, g) be a compact Riemannian manifold, $H(x, y, t)$ is the heat kernel on M^n, and $H = (4\pi t)^{-\frac{n}{2}} e^{-f}$. Define $\bar{f} = f - \int_{M^n} fH$, in Perelman's well-known paper about Ricci flow entropy, as a special case of his general claim, $[(\frac{\partial}{\partial t} + \Delta)\bar{f} + \frac{\bar{f}}{t}](x, y, t)$ is of order $O(1)$ for (x, t) near (y, 0). Motivated by this static metric case, we studied the asymptotic behavior of $\int_{M^n} fH$ and $\frac{\partial}{\partial t}(\int_{M^n} fH)$ as $t \searrow 0$, and got the asymptotic formulas. (Received September 10, 2012)

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