Title: Solution to the heat equation way symmetry analysis..

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Abstract: The family of Gaussian distributions with parameters (μ, σ), where μ is a real and σ a positive real, induces a Riemannian manifold $\mathcal{M}$ together with Fisher's information metric g^F. From this metric we can define the operator Laplace-Beltrami, with which, some classical partial differential equations are well defined, the Laplace equation, the heat equation, the Helmholtz equation are some examples. There is a way for the solution of the differential equations, ordinary or partial, in which are the infinitesimals and with these the transformations that allow to find the solutions of the equations, via analysis of symmetries. This method will be applied to find the solution to the heat equation $\Delta_{g^F} u = u_t$ in the differentiable manifold $(\mathcal{M}, g^F)$ where g^F will have the diagonal representation

$$g^F = \begin{bmatrix} \frac{1}{\sigma^2} & 0 \\ 0 & \frac{2}{\sigma^2} \end{bmatrix}.$$

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