Abstract

New exact solutions of the evolution-type equations are constructed by means of a non-point (contact) symmetries. It is possible us to have found new classes of nonlinear heat equations for those reduction method can be successfully applied. We are able to derive the exact solutions of the heat equation with nonlinearities:

$$C_1(\chi) = -\frac{2}{\chi^5}\exp(\frac{1}{\chi})$$

$$C_2(\chi) = \frac{1}{\chi(C\chi+1)}, \qquad C = const$$

$$C_3(\chi) = \frac{1}{r}\{\frac{(\chi-1)^{(1-r)/r}}{\chi^{\frac{2+r}{r}}}\}$$

$$C_4(\chi) = \frac{1}{1+\chi^2}$$

$$C_5(\chi) = \frac{\arctan\chi\,\exp(\arctan\chi)}{1+\chi^2}$$

As far as we know, this is the first application of the non-point symmetries of evolution equation for construction of its exact solutions.