

Separation Method for Obtaining New Exact Solutions to Nonlinear Partial Differential Equations

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Abstract.

The equation $u_t = \frac{A(u)}{x} u_x + (B(u) u_x)_x$ is studied using the relationship between the methods GCS and FVS. We describe all nonlinearities A and B with which the equation will be separable. This leads to the equivalence to some well known equations and consequently to obtain new exact solutions

المستخلص.

المعادلة $u_t = \frac{A(u)}{x} u_x + (B(u) u_x)_x$ درست باستخدام العلاقة بين الطريقتين GCS و FVS. لقد وصفنا كل اللاخطية لـ A و B والتي تجعل المعادلة قابلة للفصل. وقد أدى ذلك إلى معادلات مكافئة لمعادلات معروفة ونتج عن ذلك إيجاد حلولها المضبوطة.

1. Introduction.

Historically, the theory of functional variable separation FVS has been developed most intensively and proved most useful for two classes of partial differential equations, first order differential equations and linear