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CMP 2006 : 5

(I) 76M60

76N15

76W05

**Oliveri, Francesco** (I-MESS; Messina)

**On substitution principles in ideal magneto-gasdynamics by means of Lie group analysis. EN(English summary)**

*Nonlinear Dynam.* **42** (2005), no. 3, 217–231.

Reviewer: *Meleshko, Sergey V.*

024708 (Nakhon Ratchasima)

APR 21 2006

REVIEWER: Please give 5-character classification(s) according to the 2000 Mathematics Subject Classification (MSC2000). (See [www.ams.org/msc/](http://www.ams.org/msc/))

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Sergiy

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(I) 76M60

76D10

Soh, C. Wafo [Wafo Soh, C.]

Phiri, P. A.

Pooe, C. A.

Nonequivalent similarity reductions of steady 2D thermal boundary layer equations for an incompressible laminar flow over a continuous moving hot surface. EN(English summary)

Fluid Dynam. Res. 37 (2005), no. 6, 430–442.

Reviewer: Meleshko, Sergey V.

024708 (Nakhon Ratchasima)

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(I) 76D05

35Q30

76M60

**Thailert, K.**

**One class of regular partially invariant solutions of the Navier-Stokes equations. EN(English summary)**

*Nonlinear Dynam.* **43** (2006), no. 4, 343–364.

Reviewer: *Meleshko, Sergey V.*

024708 (Nakhon Ratchasima)

AUG 14 2006

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Reviewer: Meleshko, Sergey, V  
Reviewer number: 024708  
Address: sergey@math.sut.ac.th  
Author: Oliveri, Francesco  
Short title: On substitution principles in ideal magneto-gasdynamics by means of Lie group analysis.  
MR Number: 2186328  
Primary classification: 76M60  
Secondary classification(s): 76W05  
The manuscript is devoted to applications of substitution principle to ideal magneto-gasdynamics equations. In gas dynamics the substitution principle is known as the Munk-Prim transformation. The substitution principle is extended for more general than separable state equations. An additional transformation for a plane flow of a polytropic magnetic gas with  $\gamma = 2$  is obtained.

This is a review text file submitted electronically to MR.  
Reviewer: Meleshko, Sergey, V  
Reviewer number: 024708  
Address: sergey@math.sut.ac.th  
Author: Soh, C. Wafo; Phiri, P. A.; Pooe, C. A.  
Short title: Nonequivalent similarity reductions of steady 2D thermal boundary layer equations for an incompressible laminar flow over a continuous moving hot surface.  
MR Number: 2189435  
Primary classification: 76D10  
Secondary classification(s): 76M60  
Group analysis is applied to the steady, thermal, two-dimensional boundary layer equations. The admitted Lie algebra is the direct sum of finite part (which consists of five or six generators) and one more generator which is defined by an arbitrary function.  
Classifications of one-dimensional subalgebras of finite parts are given. Invariant solutions of these subalgebras are studied.

Reviewer: Meleshko, Sergey, V  
Reviewer number: 024708  
Address: sergey@math.sut.ac.th  
Author: Kantima Thailert  
Short title: One class of regular partially invariant solutions of the Navier-Stokes equations.  
MR Number: Primary classification: 76M60  
Secondary classification(s): 35Q30  
This manuscript deals with an application of group analysis to the Navier-Stokes equations. All regular partially invariant solutions of the Navier-Stokes equations with defect one and rank one are studied. It is proven that the area of applications of the algorithm for constructing partially invariant solutions can be extended: there exist partially invariant solutions with respect to Lie groups which are not admitted by the Navier-Stokes equations. A part of the thesis is devoted to Lie groups of Bäcklund transformations. These Lie groups are admitted by the system of partial differential equations which arise from the study of partially invariant solutions of the Navier-Stokes equations. The existence of Lie groups of Bäcklund transformations of finite order tangency is proven.