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## Physics

### Reports outline heat transfer research research from S.P. Mahulikar and colleagues

2010 DEC 21 - (VerticalNews.com) -- "Analyses of laminar fully-developed forced convection with viscous dissipation in annulus has revealed additional theoretical concepts and mathematical handling techniques, even for limiting cases with simple solutions. Because Nusselt and Brinkman numbers by themselves are incomplete to handle convection with viscous dissipation, another dimensionless number combining them is introduced," scientists in Bombay, India report.

"This group directly links convection with viscous dissipation, and shrinks the complexity of mathematical analysis. When the different boundary conditions on the two annulus walls are interchanged, solution can be obtained using reciprocal of aspect ratio of annulus in place of aspect ratio, in the earlier solution. This property of mathematical solutions for annulus is termed as the inverse aspect ratio symmetry," wrote S.P. Mahulikar and colleagues.

The researchers concluded: "Because this symmetry is a property of the geometry, its validity extends beyond the current scope of laminar fully-developed flow and viscous dissipation analyses."

Mahulikar and colleagues published their study in *International Journal of Heat and Mass Transfer* (A modified dimensionless number and geometric symmetry in annulus convection with viscous dissipation. *International Journal of Heat and Mass Transfer*, 2010;53(25-26):5976-5983).

For more information, contact S.P. Mahulikar, Indian Institute Technology, Dept. of Aerosp Engineering, PO IIT Powai, Bombay 400076, Maharashtra, India.

Publisher contact information for the *International Journal of Heat and Mass Transfer* is: Pergamon-Elsevier Science Ltd., the Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England.

Keywords: City: Bombay, Country: India, Dimensionless Number, Geometry, Heat Transfer Research, Mathematics, Physics

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