

## 2010 CCC Reports

### Mold Fluid Flow: Practical

#### **Investigation of Mold Flux Entrainment in CC Molds Due to Shear Layer Instability**

L.C. Hibbeler and B.G. Thomas  
CCC Report 201001

#### **Effect of Stopper-Rod Misalignment on Fluid Flow in Continuous Casting of Steel**

R. Chaudhary, G.G. Lee, B.G. Thomas, S.M. Cho, S.-H. Kim, and O.-D. Kwon  
CCC Report 201011

#### **Effect of Stopper-Rod Misalignment on Asymmetric Flow and Vortex Formation in Steel Slab Casting**

S.M. Cho, G.G. Lee, S.H. Kim, R. Chaudhary, O.D. Kwon, B.G. Thomas  
Jim Evans Honorary Symposium, TMS Annual Meeting, (Seattle, WA, Feb. 14-18, 2010), TMS, Warrendale, PA, 2010.

### Fluid Flow: Model Evaluation and Improvement

#### **Assessment of LES and RANS turbulence models with measurements in liquid metal GalSn model of continuous casting process**

R. Chaudhary, C. Ji, and B. G. Thomas  
CCC Report 201013

#### **Evaluation of turbulence models in MHD channel and square duct flows**

R. Chaudhary, S.P. Vanka, and B.G. Thomas  
Journal of Turbulence, in press, June, 2010.

#### **Direct Numerical Simulations of Magnetic Field Effects on Turbulent Flow in a Square Duct**

R. Chaudhary, S.P. Vanka, and B.G. Thomas  
CCC Report 201012

### Heat Transfer

#### **A Novel Steady-state Technique for Measuring the Heat Extracted by**

**Secondary Cooling Sprays**

C.A. Hernández, A.H. Castillejos, F.A. Acosta, X. Zhou\* and B.G. Thomas\*  
AISTech 2010, Pittsburgh, PA, May 3-6, 2010, Assoc. Iron Steel Technology,  
Warrendale, PA.

**Real-Time Model-Based Spray-Cooling Control System for Steel  
Continuous Casting (revised)**

Bryan Petrus, Kai Zheng, Brian G. Thomas, Joseph Bentsman  
Metallurgical and Materials Transactions B, submitted, 2010.

**Calibration of Mold Heat Transfer Models with Breakout Shell  
Measurements**

J. Iwasaki and B.G. Thomas  
CCC Report 201015

**User-friendly Interface Design and Development for Continuous-Casting  
Model CON1D**

H. Jasti (MS Thesis)  
CCC Report 201004

**Precipitate Formation****Equilibrium Model of Precipitation in Microalloyed Steels**

K. Xu, B.G. Thomas, and R.J. O'Malley  
Metallurgical and Materials Transactions B, in press, 2010.

**Microalloy Precipitation in Hot Charged Slabs**

M.S. Dyer, J.G. Speer, D. K. Matlock, A. J. Shutts, S. Jansto, K. Xu, B.G.  
Thomas  
AISTech 2010, Pittsburgh, PA, May 3-6, 2010, Assoc. Iron Steel Technology,  
Warrendale, PA.

**Particle-Size-Grouping Model of Precipitation Kinetics in Microalloyed  
Steels**

K. Xu and B.G. Thomas  
CCC Report 201014

**Stress and Cracking****Measuring Mechanical Behavior of Steel During Solidification: Modeling the  
SSCC Test**

M. Rowan, B.G. Thomas, C. Bernhard, R. Pierer  
CCC Report 201002.

## Computational Modeling

### **Multiphysics Model of Metal Solidification on the Continuum Level**

S. Koric, L. Hibbeler, R. Liu, and B. G. Thomas  
CCC Report 201016

### **Enhanced Latent Heat Method to Incorporate Superheat Effects into Fixed-Grid Multiphysics Simulations**

Koric, S., B.G. Thomas, and V.R. Voller  
Numerical Heat Transfer B, in press, 2010.

## Related Processes

### **Modeling Steel Slab Heat Transfer During Scarfing Processing**

X. Zhou and B.G. Thomas  
CCC Report 201003

## Reprints

### **Effect of Refractory Properties on Initial Bubble Formation in Continuous Casting Nozzles (reprint)**

G.-G. Lee, B.G. Thomas, and S.-H. Kim  
Met. Mater. Int., Vol. 16, No. 3 (2010), pp. 501-506

### **Industry Implementation of Mathematical Models: Examples in Steel Processing; Howe Memorial Lecture, 2009**

B. G. Thomas  
Iron and Steel Technology, July, 2010, pp. 70-87

### **Modeling of Hot Tearing and Other Defects in Casting Processes (reprint)**

B.G. Thomas  
ASM Handbook V. 22A, 2009, pp. 362-371