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# THERMAL SCIENCE

## International Scientific Journal

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### AN INVERSE STEFAN PROBLEM RELEVANT TO BOILOVER: HEAT BALANCE INTEGRAL SOLUTIONS AND ANALYSIS

#### ABSTRACT

Stefan problems relevant to burning oil-water systems are formulated. Two moving boundary sub-problems are defined: burning liquid surface and formation of a distillation ("hot zone") layer beneath it. The basic model considers a heat transfer equation with internal neat generation due to radiation flux absorbed in the fuel depth. Inverse Stefan problem corresponding to the first case solved by the heat balance integral method and dimensionless scaling of semi-analytical solutions are at issue.

#### KEYWORDS

[fire](#), [boilover](#), [Stefan problems](#), [heat balance integral](#), [traveling wave-like solution](#), [Koseki's thermal wave](#), [critical fuel depth](#)

PAPER SUBMITTED: 2006-12-15

PAPER REVISED: 2007-04-20

PAPER ACCEPTED: 2007-05-05

DOI REFERENCE: [TSCI0702141H](#)

CITATION EXPORT: [view in browser](#) or [download as text file](#)

THERMAL SCIENCE YEAR 2007, VOLUME [11](#), ISSUE [2](#), PAGES [141 - 160]

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