

STEFAN PROBLEMS WITH THE UNILATERAL BOUNDARY CONDITION ON THE FIXED BOUNDARY I

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0. Introduction

This paper is concerned with the following one dimensional one phase Stefan problems with the unilateral boundary condition on the fixed boundary: Given the data, ϕ and l , find two functions $s=s(t)$ and $u=u(x, t)$ such that the pair (s, u) satisfies

$$(S) \quad \begin{cases} (0.1) & Lu \equiv u_{xx} - u_t = 0, & 0 < x < s(t), & 0 < t \leq T, \\ (0.2) & u_x(0, t) \in \gamma(u(0, t)), & & 0 < t \leq T, \\ (0.3) & u(s(t), t) = 0, & & 0 < t \leq T, \end{cases}$$