

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
DEPARTMENT OF PHYSICS  
8.962 SPRING 2006

PROBLEM SET 1: CLARIFICATION

Problem 2 of pset 1 begins as follows:

2. In some reference frame, the vector fields  $\vec{U}$  and  $\vec{D}$  have the components

$$U^\alpha \doteq (1 + t^2, t^2, \sqrt{2}t, 0)$$
$$D^\alpha \doteq (x, 5tx, \sqrt{2}t, 0) .$$

The scalar  $\rho$  has the value

$$\rho = x^2 + t^2 - y^2 .$$

(The relationship “LHS  $\doteq$  RHS” means “the object on the left-hand side is represented by the object on the right-hand side in the specified reference frame.”)

*Clarification:* The quantities  $t$ ,  $x$ , and  $y$  in these vectors are just the usual Cartesian coordinates in the specified reference frame.