TABLE I

Different Types of Radiative Transfer Inverse Problems

A. Sensing (temperature-independent) applications

1. Optical property estimation: for the mean number of secondaries and the expansion coefficients of the angular scattering function

2. Optical thickness estimation: for the thickness of the medium above a surface of known or unknown albedo (e.g., assuming a Lambertian reflection law)

3. Internal source estimation: for the magnitude and location of sources within the medium

4. Boundary condition estimation: for the angular distribution of incident or reflected radiation at boundaries of the medium that causes a measured distribution at another spatial location

B. Energy balance (temperature-dependent) applications

1. Heat flux estimation: for only radiative transfer, or radiative transfer plus conduction or convection or both

2. Temperature estimation: for only radiative transfer, or radiative transfer plus conduction or convection or both

TABLE II

Considerations When Developing a Solution to an Inverse Radiative Transfer Problem

A. Radiation detectors

1. Field of view

a. Narrow (collimated)

b. Broad (angle integrated)

2. Location

a. Outside the medium (remote)

b. Inside the medium (*in situ*)

B. Source of photons

1. Type of illumination

a. Passive (inherent radiation field)

b. Active (induced radiation field)

2. Time dependence

a. Steady state (e.g., a continuous-working laser)

b. Pulsed (e.g., a pulsed laser)

3. Location

a. On the medium boundary (external)

b. Inside the medium (*in situ*)