

# **THEORETICAL DEVELOPMENT FOR REFRACTIVE INDEX RECONSTRUCTION FROM A RADIATIVE TRANSFER EQUATION-BASED ALGORITHM**

Joan Boulanger<sup>\*</sup>, Olivier Balima<sup>\*\*</sup> and André Charette<sup>\*\*</sup>

<sup>\*</sup>National Research Council, Montréal Rd Campus  
M-10, Ottawa, ON K1A 0R6 Canada

<sup>\*\*</sup>Université du Québec à Chicoutimi, 555 Bd Université  
Chicoutimi QC G7H 2B1 Canada

**ABSTRACT.** This study is devoted to the mathematics behind a reconstruction methodology based on the radiative transfer equation of a refractive index arbitrary distribution. The targeted algorithm should be of the least-squares and gradient type, relying on the adjoint to the radiative transfer equation for varying refractive index, which is a novelty. Preliminary tests are demonstrated on generic phantoms.