

# Description of a ray trace algorithm for the evaluation of pump power absorption in double-clad fibers

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## Abstract

An algorithm for the analysis of the double-clad fiber design is presented. The algorithm developed in the MATLAB computing language, is based on ray tracing method applied to three-dimensional graphics figures which are composed of a set of planes. The algorithm can evaluate an arbitrarily large number of ray paths calculating the corresponding pump absorption in each of the fiber elements according to the Lambert-Beer law. The beam path is evaluated in three dimensions considering the losses by reflection and refraction both at the fiber faces and within the fiber. Due to its flexibility, the algorithm can be used to study the ray propagation in double-clad fiber with: i) variable geometries of the inner clad and the core; ii) different position of the core inside the inner clad; and iii) bending and taper effects.

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