

## Optimization of double layered beam shaping assembly using genetic algorithm

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<b>Abstract</b>	<p>The genetic algorithm method is a new method used to obtain radiation beams that meet the IAEA requirements. This method is used in optimization of configurations and compositions of materials that compose double layered Beam Shaping Assembly (BSA). The double layered BSA is modeled as having two layers of material for each of the components, which are the moderator, reflector, collimator, and filter. Up to 21St generation, the optimization results in four (4) individuals having the capacity to generate the most optimum radiation beams. The best configuration, producing the most optimum radiation beams, is attained by using combinations of materials, that is by combining Al with either one of CaF<sub>2</sub> and PbF<sub>2</sub> for moderator; combining Pb material with either Ni or Pb for reflector; combining Ni and either FeC or C for collimator, and FeC+LiF and Cd for fast and thermal neutron filter. The parameters of radiation resulted from the four configurations of double layer BSA adequately satisfy the standard of the IAEA.</p>
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