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## New Model for Simulation of Light Reflection in GEANT4

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### Summary

In the simulation of optical reflection with the Unified model, GEANT4 makes some approximations that are far from ideal in some conditions. In the V.U.V. region the material reflectivity is not normally well described with this model due to the usually low reflectivity at these wavelengths. Furthermore some materials, for example PTFE, have a complex reflectivity profile which is not well described with the Unified Model. We have introduced a new model in GEANT4 simulation which consists of a diffuse lobe plus a specular lobe. The diffuse lobe is described by the Wolff-Oren-Nayar model which takes into account both the roughness of the surface, the viewing and incident angles. The specular lobe is described by the geometrical model of Torrance and Sparrow. The model introduced is valid for high and low reflectivities and also for dielectrics and metals.

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