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Subject: ConstructOpGeometry function

Posted by [Maria Patsyuk](#) on Mon, 14 Feb 2011 16:45:06 GMT

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Hello,

does maybe someone happen to know what exactly the following function from FairModule.h does and what is the right way to use it:

```
/**method called from the MC application to set optical geometry properties*/  
virtual void ConstructOpGeometry();
```

I'd like to use it to define a polished surface around the bar to prevent Cherenkov photons to leave the bar (parameter REFLECTIVITY = 1) and to define a photodetector surface with realistic efficiency as a function of photon wavelength (parameter EFFICIENCY).

How I tried to do so is the following (volumes separated by these surfaces are made of materials with Cherenkov properties (Fused Silica and air), which are in media\_pnd.geo file). I just added the following function to my detector class:

```
void PndDrc::ConstructOpGeometry()  
{  
    Int_t npoints = 2;  
  
    Double_t ephoton[npoints];  
    ephoton[0] = 1.0e-09;  
    ephoton[1] = 10.0e-09;  
    Double_t reflectivity[npoints];  
    reflectivity[0] = 1.;  
    reflectivity[1] = 1.;  
    Double_t efficiency[npoints];  
    efficiency[0] = 0.5;  
    efficiency[1] = 0.5;  
  
    gMC->DefineOpSurface("BarSurface", kGlisur, kDielectric_dielectric, kPolished, 0.1);  
    gMC->SetBorderSurface("BarSurface", "DrcBarSensor", 1, "DrcAirBox", 0, "BarSurface");  
  
    gMC->DefineOpSurface("EVSurface", kGlisur, kDielectric_dielectric, kPolished, 0.1);  
    gMC->SetBorderSurface("EVSurface", "DrcEV", 1, "BarrelDIRC", 0, "EVSurface");  
  
    gMC->SetMaterialProperty("BarSurface", "REFLECTIVITY", npoints, ephoton, reflectivity);  
    gMC->SetMaterialProperty("BarSurface", "EFFICIENCY", npoints, ephoton, efficiency);  
  
    gMC->SetMaterialProperty("EVSurface", "REFLECTIVITY", npoints, ephoton, reflectivity);  
    gMC->SetMaterialProperty("EVSurface", "EFFICIENCY", npoints, ephoton, efficiency);  
}
```

But I haven't seen any changes in the output of the simulation with and without this function! It seems not to work this way. So I'm wondering how to use this function properly.

Some particular questions I've got are:

1. where are the default names of the parameters (REFLECTIVITY, EFFICIENCY...) defined?

Can I see the list of available parameters with their meanings?

2. what is the difference between UNIFIED and GLISUR model for polished surfaces? (I found some explanations about it, but didn't quite get the idea)

3. did I understood right, that a Cherenkov photon could be detected only on the dielectric-metal border, where the parameter EFFICIENCY as a function of a wavelenght is set?

I would appreciate any help!

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