```
//
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// ********************************************************************
//
//          Filippo Ambroglini : filippo.ambroglini@pg.infn.it
//
//....oooOOOOOooo........oooOOOOOooo........oooOOOOOooo........oooOOOOOooo......
//....oooOOOOOooo........oooOOOOOooo........oooOOOOOooo........oooOOOOOooo......

#include "CalorimeterConstructionConfig6.hh"

#include "G4NistManager.hh"
#include "HEPDSWMaterial.hh"
#include "G4Box.hh"
#include "G4SubtractionSolid.hh"
#include "G4UnionSolid.hh"
#include "G4LogicalVolume.hh"
#include "G4PVPlacement.hh"
#include "G4PVReplica.hh"
#include "G4IntersectionSolid.hh"
#include "G4Trap.hh"
#include "G4Cons.hh"

#include "G4GeometryManager.hh"
#include "G4PhysicalVolumeStore.hh"
#include "G4LogicalVolumeStore.hh"
#include "G4SolidStore.hh"
#include "G4VisAttributes.hh"
#include "G4SDManager.hh"
#include "CalorimeterSD.hh"
#include "VetoSD.hh"

#include "G4UnitsTable.hh"
#include "G4PhysicalConstants.hh"
#include "G4SystemOfUnits.hh"
#include <iomanip>

//....oooOOOOOooo........oooOOOOOooo........oooOOOOOooo........oooOOOOOooo......
CalorimeterConstructionConfig6::CalorimeterConstructionConfig6()
  :fSolidS1(0),
   fSolidS1SuppHoleBar(0),
   fSolidS1SuppBack(0),
   fSolidS1SuppTopBase(0),
   fSolidS1SuppTopHole(0),
   fSolidS1SuppFrontTemp0(0),
   fSolidS1SuppFrontTemp1(0),
   fSolidS1SuppFrontTemp2(0),
```



```
   fSolidS1SuppFront(0),
   fSolidS1ScintContainer(0),
   fSolidS1Scint(0),

   fSolidCaloBox(0),fSolidScintBox(0),fSolidCrystalBox(0),fSolidLayer(0),fSolidA
ctiveLayer(0),
   fSolidCFBlockContainerExt(0),fSolidCFBlockContainerInt(0),fSolidCFBlockContai
ner(0),
   fSolidSingleCrystalBlockContainer(0),
   fSolidCrystalActiveBlock(0),fSolidCFCrystalPanelDown(0),
   fSolidCrystalBlockContainer(0),fSolidCrystalBlockRawContainer(0),fSolidCFCrys
talSideX(0),
   fSolidCFCrystalSideYBig(0),
   fSolidCFFront(0),fSolidCFLat(0),fSolidCFSuppO(0),fSolidCFSuppV(0),fSolidCFSup
pLat(0),fSolidCFSuppFront(0),fSolidCFSuppLatA(0),fSolidCFSuppFrontA(0),
   fSolidCFSuppPoron(0), fSolidCFSuppStepOV(0),fSolidCFSuppStepLat1(0),fSolidCFS
uppStepLat2(0),fSolidCFSuppStepFront1(0),fSolidCFSupp(0),fSolidCFSuppStepLat1A(0
),
   fSolidCFSuppStepLat2A(0),fSolidCFSuppStepFront1A(0),fSolidCFSuppA(0), fSolidP
oronFront(0), fSolidPoronLat(0), fSolidPoronFrontPO(0),fSolidPoronLatPO(0),
   fSolidPoronLatX(0),fSolidVetoLatX(0),fSolidPoronLatY(0),fSolidVetoLatY(0),
   // fSolidHoneyCombLatY(0),
   //fSolidHoneyCombSkinLatY(0),fSolidHoneyCombLatX(0),fSolidHoneyCombSkinLatX(0
),fSolidHoneyCombBottom(0),fSolidHoneyCombSkinBottom(0),

   fLogicS1(0),
   fLogicS1SuppBack(0),
   fLogicS1SuppHoleBar(0),
   fLogicS1SuppFront(0),
   fLogicS1SuppThinBar(0),
   fLogicS1ScintContainerP(0),
   fLogicS1ScintContainerM(0),
   fLogicS1Scint(0),

   fLogicCaloBox(0),fLogicScintBox(0),fLogicCrystalBox(0),fLogicScintLayer(0),fL
ogicScintActiveLayer(0),
   fLogicCrystalBlockContainer(0),fLogicCrystalBlockPlaneContainer(0),fLogicCrys
talBlockRawContainer(0),fLogicCrystalActiveBlock(0),
   fLogicCFCrystalPanelDown(0),fLogicCFBlockContainer(0),
   fLogicCFCrystalSideX(0),fLogicCFCrystalSideYBig(0),
   fLogicCFFront(0),fLogicCFLat(0),fLogicCFFrontPO(0),fLogicCFLatPO(0),fLogicCFS
upp(0),fLogicCFSuppTop(0),fLogicPoronLat(0), fLogicPoronFront(0),fLogicPoronLatP
O(0),fLogicPoronFrontPO(0), fLogicPoronLatX(0),
   fLogicPoronLatY(0),fLogicVetoLatX(0),fLogicVetoLatY(0),

   fPhysiS1(0),
   fPhysiS1SuppBack(0),
   fPhysiS1SuppThinBar1(0),
   fPhysiS1SuppFrontM(0),
   fPhysiS1SuppThinBar2(0),
   fPhysiS1ScintContainerP(0),
   fPhysiS1ScintContainerM(0),
   fPhysiS1ScintP(0),
   fPhysiS1ScintM(0),

   fPhysiCaloBox(0),fPhysiScintBox(0),fPhysiScintLayer(0),fPhysiScintCFSupp(0),f
PhysiScintActiveLayer(0),fPhysiScintCFFrontP(0),fPhysiScintCFFrontM(0),fPhysiSci
ntCFLatP(0),fPhysiScintCFLatM(0),fPhysiScintPoronLatP(0),fPhysiScintPoronLatM(0)
,fPhysiScintPoronLatUp(0),fPhysiScintPoronLatDown(0),
   fPhysiCrystalBox(0),fPhysiCFCrystalPanelDown(0),fPhysiCFCrystalSideXP(0),fPhy
siCFCrystalSideXM(0),fPhysiCFCrystalSideYBigP(0),fPhysiCFCrystalSideYBigM(0),fPh
ysiCrystalBlockPlaneContainer(0),fPhysiCrystalBlockRaw(0),
   fPhysiCrystalActiveBlock(0),
   fPhysiCFSuppTop(0)
{

  pMaterial           = new HEPDSWMaterial();
```

```
  // S1 Scintillator
  fS1ScintNumber     = 6;

  fS1_X = 242*mm;//224*mm;
  fS1_Y = 241.12;//223.72*mm;
  fS1_Z = 10.5*mm;

  fS1SuppBottom_X  = 200*mm;
  fS1SuppBottom_Y  = 241.12*mm;
  fS1SuppBottom_Z  = 0.5*mm;

  fS1SuppHoleBar_X  = 242*mm;
  fS1SuppHoleBar_Y  = 6*mm;
  fS1SuppHoleBar_Z  = 5*mm;

  fS1SuppBar_X  = 242*mm;
  fS1SuppBar_Y  = 27.56*mm;
  fS1SuppBar_Z  = 6.14*mm;

  fS1SuppTopBase_X  = 6*mm;
  fS1SuppTopBase_Y  = 241.12;//202*mm;
  fS1SuppTopBase_Z  = 3.86*mm;

  fS1SuppTopHole_Y  = 90*mm;
  fS1SuppTopHole_X  = 2*mm;
  fS1SuppTopHole_Z  = 3*mm;

  fS1SuppThinBar_Y  = 186*mm;
  fS1SuppThinBar_X  = 20*mm;         // piccola approsimazione. In realtà la sov
rapposizione tra fS1SuppThinBar e fS1SuppBar è più complessa
  fS1SuppThinBar_Z  = .5*mm;         // e agli angoli lo spessore è un po divers
o

  fS1SuppThinBarBack_Y  = 241.12*mm;
  fS1SuppThinBarBack_X  = 20*mm;
  fS1SuppThinBarBack_Z  = .5*mm;

  fS1SuppPoron_Y = 185*mm;
  fS1SuppPoron_X = 6*mm;
  fS1SuppPoron_Z = 1.14*mm;

  fS1ScintContainer_Y = 90*mm;
  fS1ScintContainer_X = 242*mm;
  fS1ScintContainer_Z = 5*mm;

  fS1Scint_Y = 30*mm;
  fS1Scint_X = 242*mm; //210*mm
  fS1Scint_Z = 5*mm;
  ////////////////////////////////////////


  // Calorimeter
  fNbOfScintLayers   = 16;
  fNbOfReplicatedScintLayers   = 15;

  fCaloLayer_X    = 177*mm;
  fCaloLayer_Y    = 177*mm;
  fCaloLayer_Z    = 14.78*mm;

  fCaloLastLayer_X    = 177*mm;
  fCaloLastLayer_Y    = 177*mm;
  fCaloLastLayer_Z    = 13.64*mm;

  fCalo_X = 177*mm;
  fCalo_Y = 177*mm;
  fCalo_Z = 280.34*mm;   // dimensione dell'intero calorimetro

  fScint_X = 177*mm;
  fScint_Y = 177*mm;
```



```
  fScint_Z = fCaloLayer_Z*fNbOfReplicatedScintLayers;

  fCrystal_X = 177*mm;
  fCrystal_Y = 177*mm;
  fCrystal_Z = 45*mm;

  fCFBlockContainerExt_X = 50.8*mm;
  fCFBlockContainerExt_Y = 50.8*mm;
  fCFBlockContainerExt_Z = 40.0*mm;

  TeflonContainerExt_X = 48.2*mm;
  TeflonContainerExt_Y = 48.2*mm;
  TeflonContainerExt_Z = 40.2*mm;

  fTeflonLYSO_X = 48.2*mm;
  fTeflonLYSO_Y = 48.2*mm;
  fTeflonLYSO_Z = 40.2*mm;

  // cubi di LYSO
  fCrystalBlock_X = 48*mm;
  fCrystalBlock_Y = 48*mm;
  fCrystalBlock_Z = 40*mm;

  fCFCrystalPanelDown_X = 177*mm;
  fCFCrystalPanelDown_Y = 177*mm;
  fCFCrystalPanelDown_Z = 3*mm;

  fCylinderRadiusMax1 = 9*mm;
  fCylinderRadiusMin1 = 0*mm;
  fCylinderRadiusMax2 = 9*mm;
  fCylinderRadiusMin2 = 0*mm;
  fCylinderZ = 3*mm;

  fCFCrystalPanelDown2_X = 158.4*mm;
  fCFCrystalPanelDown2_Y = 158.4*mm;
  fCFCrystalPanelDown2_Z = 5. *mm;

  fCFCrystalHole_X = 44.8*mm;
  fCFCrystalHole_Y = 44.8*mm;
  fCFCrystalHole_Z = 5*mm;

  fCrystalBlockContainer_X = 152.4*mm;
  fCrystalBlockContainer_Y = 152.4*mm;
  fCrystalBlockContainer_Z = 40*mm;

  fCrystalBlockRawContainer_X = 152.4*mm;
  fCrystalBlockRawContainer_Y = 50.8*mm;
  fCrystalBlockRawContainer_Z = 40*mm;

  // costola laterale LYSO
  fCFCrystalSideX_X = 10.9*mm;
  fCFCrystalSideX_Y = 122*mm;
  fCFCrystalSideX_Z = 42*mm;

  // costola superiore LYSO
  fCFCrystalSideYSmall_X = 0.1*mm;
  fCFCrystalSideYSmall_Y = 0.1*mm;
  fCFCrystalSideYSmall_Z = 0.1*mm;

  fCFCrystalSideYBig_X = 122*mm;
  fCFCrystalSideYBig_Y = 10.9*mm;
  fCFCrystalSideYBig_Z = 42*mm;


  fCFLat_X = 10*mm;            //
  fCFLat_Y = 60*mm;            //
  fCFLat_Z = 11.14*mm;         //
                               // costole laterali e frontali delle croci
  fCFFront_X = 60*mm;          //
```

```
  fCFFront_Y = 10*mm;          //
  fCFFront_Z = 11.14*mm;       //


  fPoronFront_X = 60*mm;
  fPoronFront_Y = 3.18*mm;
  fPoronFront_Z = 11.14*mm;

  fPoronLat_X = 3.18*mm;
  fPoronLat_Y = 60*mm;       // poron sotto blocchi croce destra-sinistra
  fPoronLat_Z = 11.14*mm;

  fCFLatPO_X =  10*mm;
  fCFLatPO_Y =  60*mm;
  fCFLatPO_Z =  1.14*mm;

  fCFFrontPO_X =  60*mm;
  fCFFrontPO_Y =  10*mm;
  fCFFrontPO_Z =  1.14*mm;


  fPoronFrontPO_X =  60*mm;
  fPoronFrontPO_Y =  3.18*mm;
  fPoronFrontPO_Z = 1.14*mm;

  fPoronLatPO_X =  3.18*mm;
  fPoronLatPO_Y = 60*mm;
  fPoronLatPO_Z =  1.14*mm;

  fCFSuppO_X = 150.64*mm;    //
  fCFSuppO_Y = 3*mm;         //  braccio N-S della croce carbonio
  fCFSuppO_Z = 2.5*mm;       //

  fCFSuppV_X = 3*mm;          //
  fCFSuppV_Y = 150.64*mm;     //  braccio E-O della croce carbonio
  fCFSuppV_Z = 2.5*mm;        //

  fCFSuppPorO_X = 149*mm;    //
  fCFSuppPorO_Y = 7*mm;      // braccio N-S croce poron
  fCFSuppPorO_Z = 1.14*mm;   //


  fCFSuppPorV_X = 7*mm;      //
  fCFSuppPorV_Y = 149*mm;    // braccio E-O croce poron
  fCFSuppPorV_Z = 1.14*mm;   //


  fCFSuppAO_X = 150.64*mm;       //
  fCFSuppAO_Y = 3*mm;            //
  fCFSuppAO_Z = 2.9*mm;          //
                                 //
  fCFSuppAV_X = 3*mm;            //
  fCFSuppAV_Y = 150.64*mm;       //  croce carbonio trigger S2
  fCFSuppAV_Z = 2.9*mm;          //
                                 //
  fCFSuppLatA_X = 13.18*mm;      //
  fCFSuppLatA_Y = 14*mm;         //
  fCFSuppLatA_Z = 2.9*mm;        //
                                 //
  fCFSuppFrontA_X = 14*mm;       //
  fCFSuppFrontA_Y = 13.18*mm;    //
  fCFSuppFrontA_Z = 2.9*mm;      //
                                 //

  fCFSuppLat_X = 13.18*mm;   //
  fCFSuppLat_Y = 60*mm;      // blocchi rettangolari attaccati alla croce a dest
ra e sinistra
  fCFSuppLat_Z = 2.5*mm;     //
```



```
  fCFSuppFront_X = 60*mm;      //
  fCFSuppFront_Y = 13.18*mm;   // blocchi rettangolari attaccati alla croce sopr
a e sotto
  fCFSuppFront_Z = 2.5*mm;     //

  fActiveLayer_X = 15*cm;
  fActiveLayer_Y = 15*cm;
  fActiveLayer_Z = 1*cm;

  fActiveRectLayer_X = 15*cm;
  fActiveRectLayer_Y = 12*cm;  // parte rettangolare centrale del piano di scint
illatore
  fActiveRectLayer_Z = 1*cm;

  fActiveTrapLayerX1 = 150*mm;
  fActiveTrapLayerX2 = 120*mm;
  fActiveTrapLayerY1 = 10*mm;   // parte trapezoidale del piano di scintillatore
  fActiveTrapLayerY2 = 10*mm;
  fActiveTrapLayerZ = 15*mm;

  fPoronPlateO_X = 147.17*mm;
  fPoronPlateO_Y = 24.06*mm;
  fPoronPlateO_Z = 3.18*mm;

  fPoronPlateV_X = 24.06*mm;
  fPoronPlateV_Y = 173.76*mm;
  fPoronPlateV_Z = 3.18*mm;


  ////////////// TRAPEZI FINALI BOTTOM VETO  //////////////

  fTrapPoronX1 = 312.48*mm ;
  fTrapPoronX2 = 71.05*mm;
  fTrapPoronY1 = 3.18*mm;
  fTrapPoronY2 = 3.18*mm;
  fTrapPoronZ =  241.43/2.*mm;

  fTrapVetoX1 = 309.20*mm ;
  fTrapVetoX2 = 67.77*mm;
  fTrapVetoY1 = 5*mm;
  fTrapVetoY2 = 5*mm;
  fTrapVetoZ =  241.43/2.*mm;

  fTrapCFX1 = 312.48*mm ;
  fTrapCFX2 = 71.05*mm;
  fTrapCFY1 = 0.7*mm;
  fTrapCFY2 = 0.7*mm;
  fTrapCFZ =  241.43/2.*mm;
  ////////////////////////////////////////////////////////


  fPoronLatX_X = 118.34*mm;
  fPoronLatX_Y = 9.53*mm;
  fPoronLatX_Z = 303.64*mm;

  fPoronLatXRight_X = 34.83*mm;  //parte laterale destra del poron esterno attor
no al calorimetro
  fPoronLatXRight_Y = 9.53*mm;
  fPoronLatXRight_Z = 280.14*mm;

  fPoronLatXHole_X = 20*mm;  //parte laterale sinistra col BUCO  del poron ester
no attorno al calorimetro
  fPoronLatXHole_Y = 9.53*mm;
  fPoronLatXHole_Z = 290.64*mm;

  fPoronLatXHoleLeft_X = 5.83*mm;  //parte laterale a sinistra del BUCO  del por
on esterno attorno al calorimetro
  fPoronLatXHoleLeft_Y = 9.53*mm;
  fPoronLatXHoleLeft_Z = 303.64*mm;
```

```
  ////////////////////////////////   VETO ////////////////////////////
  fVetoLatX_X = 118.34*mm;
  fVetoLatX_Y = 5*mm;
  fVetoLatX_Z = 303.64*mm;

  fVetoLatXRight_X = 42*mm;
  fVetoLatXRight_Y = 5*mm;
  fVetoLatXRight_Z = 280.14*mm;

  fVetoLatXLeft_X = 33*mm;
  fVetoLatXLeft_Y = 5*mm;
  fVetoLatXLeft_Z = 290.64*mm;

  fVetoLatY_X = 5*mm;
  fVetoLatY_Y = 128.4*mm;
  fVetoLatY_Z = 303.64*mm;

  fVetoLatYUp_X = 5*mm;
  fVetoLatYUp_Y = 51*mm;
  fVetoLatYUp_Z = 280.14*mm;

  fVetoLatYDown_X = 5*mm;
  fVetoLatYDown_Y = 43*mm;
  fVetoLatYDown_Z = 290.64*mm;
  ////////////////////////////////////////////////////////////////////////
///


  fPoronLatY_X = 9.53*mm;
  fPoronLatY_Y = 128.4*mm;
  fPoronLatY_Z = 303.64*mm;

  fPoronLatYUp_X = 9.53*mm;  //parte superiore/inferiore del poron esterno attor
no al calorimetro
  fPoronLatYUp_Y = 38.83*mm;
  fPoronLatYUp_Z = 280.14*mm;

  fPoronLatYHole_X = 9.53*mm;  //parte laterale sinistra col BUCO  del poron est
erno attorno al calorimetro
  fPoronLatYHole_Y = 20*mm;
  fPoronLatYHole_Z = 290.64*mm;

  fPoronLatYHoleDown_X = 9.53*mm;  //parte laterale a sinistra del BUCO  del por
on esterno attorno al calorimetro
  fPoronLatYHoleDown_Y = 10.83*mm;
  fPoronLatYHoleDown_Z = 303.64*mm;



  fCFVetoLatX_X = 152.17*mm;   //parte frontale carbonio attorno al calorimetro
  fCFVetoLatX_Y = 1*mm;
  fCFVetoLatX_Z = 310*mm;

  fCFVetoLatXHole_X = 20*mm;
  fCFVetoLatXHole_Y = 1*mm;
  fCFVetoLatXHole_Z = 293.82*mm;

  fCFVetoLatXHoleRight_X = 4.83*mm;
  fCFVetoLatXHoleRight_Y = 1*mm;
  fCFVetoLatXHoleRight_Z = 310*mm;

  fCFVetoLatY_X = 1*mm;  //parte laterale carbonio attorno al calorimetro
  fCFVetoLatY_Y = 157.70*mm;
  fCFVetoLatY_Z = 310*mm;

  fCFVetoLatYHole_X = 1*mm;
```



```
  fCFVetoLatYHole_Y = 20*mm;
  fCFVetoLatYHole_Z = 293.82*mm;

  fCFVetoLatYHoleDown_X = 1*mm;
  fCFVetoLatYHoleDown_Y = 1.3*mm;
  fCFVetoLatYHoleDown_Z = 310*mm;


  ////////////////////////////////
  //   fHoneyCombLatY_X = 10*mm;
  //   fHoneyCombLatY_Y = 192.72*mm;
  //   fHoneyCombLatY_Z = 322.24*mm;

  //   fHoneyCombSkinLatY_X = 1*mm;
  //   fHoneyCombSkinLatY_Y = 192.72*mm;
  //   fHoneyCombSkinLatY_Z = 322.24*mm;

  //   fHoneyCombLatX_X = 199.72*mm;
  //   fHoneyCombLatX_Y = 10*mm;
  //   fHoneyCombLatX_Z = 322.24*mm;

  //   fHoneyCombSkinLatX_X = 199.72*mm;
  //   fHoneyCombSkinLatX_Y = 1*mm;
  //   fHoneyCombSkinLatX_Z = 322.24*mm;

  //   fHoneyCombBottom_X = 300*mm;
  //   fHoneyCombBottom_Y = 300*mm;
  //   fHoneyCombBottom_Z = 10*mm;

  //   fHoneyCombSkinBottom_X = 300*mm;
  //   fHoneyCombSkinBottom_Y = 300*mm;
  //   fHoneyCombSkinBottom_Z = 1*mm;



  /*################ Costole poron angoli calorimetro ################### */
  fExternalPoronSupportA_X = 2.5*mm;
  fExternalPoronSupportA_Y = 9.53*mm;
  fExternalPoronSupportA_Z = 291.64*mm;

  fExternalPoronSupportB_X = 4.67*mm;
  fExternalPoronSupportB_Y = 9.53*mm;
  fExternalPoronSupportB_Z = 303.64*mm;

  fExternalPoronSupportC_X = 2.36*mm;
  fExternalPoronSupportC_Y = 14.53*mm;
  fExternalPoronSupportC_Z = 303.64*mm;

  fExternalPoronSupportD_X = 5*mm;
  fExternalPoronSupportD_Y = 2.36*mm;
  fExternalPoronSupportD_Z = 303.64*mm;

  fExternalPoronSupportE_X = 9.53*mm;
  fExternalPoronSupportE_Y = 14.53*mm;
  fExternalPoronSupportE_Z = 303.64*mm;


  fExternalPoronSupport_X = fExternalPoronSupportA_X + fExternalPoronSupportB_X
+ fExternalPoronSupportC_X + fExternalPoronSupportD_X + fExternalPoronSupportE_X
;
  ////////////////////////////////////////////////////////////////




  ComputeObjectsPositioning();

  // materials
  vetoMaterial      = "Scintillator";
```

```
  caloMaterial      = "Scintillator";
  scintMaterial     = "Scintillator";
  crystalMaterial   = "LYSO";

  poronMaterial     = "Poron";
  cfiberMaterial    = "CarbonFiber";
  honeycombMaterial = "nomex";
  teflonMaterial    = "Teflon";
  /*
    poronMaterial     = "Galactic";
    cfiberMaterial    = "Galactic";
    honeycombMaterial = "Galactic";
  */
}

//....oooOOOOOooo........oooOOOOOooo........oooOOOOOooo........oooOOOOOooo......

CalorimeterConstructionConfig6::~CalorimeterConstructionConfig6()
{
  if (pMaterial) delete pMaterial;
}

void CalorimeterConstructionConfig6::ComputeObjectsPositioning(){


  ShiftOrigin = fCalo_Z/2. + 36.16*mm + 0.7*mm;

  fPhysiS1SuppBack_Y = 0;//fS1SuppBottom_X/2.-18.860*mm-fS1SuppBottomHole_X/2.;
  fPhysiS1SuppBack_X = 0;
  fPhysiS1SuppBack_Z = -fS1_Z/2. +fS1SuppBottom_Z/2. ; //fS1SuppBottom_Z/2.-0.5*
mm-fS1SuppBottomHole_Z/2.;

  fSolidS1SuppFront_Y = 3*mm + fS1SuppTopHole_Y/2;//fS1SuppTopBase_Y/2.-8*mm-fS1
SuppTopHole_Y/2.;
  fSolidS1SuppFront_X = fS1SuppTopBase_X/2.-fS1SuppTopHole_X/2.;
  fSolidS1SuppFront_Z = fS1SuppTopBase_Z/2.-fS1SuppTopHole_Z/2.;

  fPhysiS1_Y = 0;
  fPhysiS1_X = 0;
  fPhysiS1_Z = fCalo_Z/2. + fS1_Z/2. + fCFSuppAV_Z +fCFSuppPorO_Z +7.22*mm;//
147.8*mm+18.28*mm+fS1_Z/2.;

  fPhysiS1SuppHoleBar_Y  = 0;
  fPhysiS1SuppHoleBar_X  = 0;
  fPhysiS1SuppHoleBar_Z  = -fS1_Z/2. + fS1SuppHoleBar_Z/2. +fS1SuppBottom_Z ;

  fPhysiS1SuppBar_Y  = fS1_Y/2. -fS1SuppBar_Y/2. ;
  fPhysiS1SuppBar_X  = 0;
  fPhysiS1SuppBar_Z  = -fS1_Z/2. + fS1SuppBar_Z/2. +fS1SuppBottom_Z ;

  fPhysiS1SuppThinBar_Y  = 0;
  fPhysiS1SuppThinBar_X  = fS1_X/2. -fS1SuppThinBar_X/2. ;
  fPhysiS1SuppThinBar_Z  = -fS1_Z/2. + fS1SuppThinBar_Z/2. +fS1SuppBottom_Z + fS
1ScintContainer_Z  ;

  fPhysiS1SuppThinBarBack_Y  = 0;
  fPhysiS1SuppThinBarBack_X  = fS1_X/2. -fS1SuppThinBarBack_X/2. ;
  fPhysiS1SuppThinBarBack_Z  = -fS1_Z/2. + fS1SuppThinBarBack_Z/2.;

  fPhysiS1SuppFrontM_Y = 0;
  fPhysiS1SuppFrontM_X = 0;
  fPhysiS1SuppFrontM_Z = fS1_Z/2.-fS1SuppTopBase_Z/2.;

  fPhysiS1SuppPoronFrontM_Y = 0;
  fPhysiS1SuppPoronFrontM_X = 0;
  fPhysiS1SuppPoronFrontM_Z = fS1_Z/2. -fS1SuppTopBase_Z - fS1SuppPoron_Z/2.;

  fPhysiS1ScintContainer_Y = 0 + 3*mm + fS1ScintContainer_Y/2.;           //fS1
_Y/2.-18.86*mm-fS1ScintContainer_Y/2.;
```



```
  fPhysiS1ScintContainer_X = 0;
  fPhysiS1ScintContainer_Z = -fS1_Z/2.+0.5*mm + fS1ScintContainer_Z/2.;

  fPhysiScintBox_X = 0;
  fPhysiScintBox_Y = 0;
  fPhysiScintBox_Z = fCalo_Z/2.-fScint_Z/2.;

  fPhysiLastScintLayer_X = 0;
  fPhysiLastScintLayer_Y = 0;
  fPhysiLastScintLayer_Z = +fCalo_Z/2. - fCaloLastLayer_Z/2.-fScint_Z;

  fSolidCFSuppStepLat_X = fCaloLayer_X/2.-fCFLat_X/2. -fPoronLat_X/2.;
  fSolidCFSuppStepLat_Y = 0;
  fSolidCFSuppStepLat_Z = 0;

  fSolidCFSuppStepFront_X = 0;
  fSolidCFSuppStepFront_Y = fCaloLayer_Y/2.-fCFFront_Y/2. -fPoronFront_Y/2.;
  fSolidCFSuppStepFront_Z = 0;

  fPhysiCFSuppPor_X = 0;
  fPhysiCFSuppPor_Y = 0;
  fPhysiCFSuppPor_Z = fCaloLayer_Z/2. - fCFSuppPorV_Z/2. -fActiveLayer_Z ;

  fPhysiCFSupp_X = 0;
  fPhysiCFSupp_Y = 0;
  fPhysiCFSupp_Z =  fCaloLayer_Z/2. - fCFSuppV_Z/2. -fActiveLayer_Z  - fCFSuppPo
rV_Z ;

  fPhysiCFSuppPor2_X = 0;
  fPhysiCFSuppPor2_Y = 0;
  fPhysiCFSuppPor2_Z = fCaloLayer_Z/2. - fCFSuppPorV_Z/2. -fActiveLayer_Z -fCFSu
ppPorV_Z - fCFSuppV_Z  ;

  fPhysiActiveLayer_X = 0;
  fPhysiActiveLayer_Y = 0;
  fPhysiActiveLayer_Z = fCaloLayer_Z/2. -fActiveLayer_Z/2.;

  fPhysiCFFront_X = 0;
  fPhysiCFFront_Y = fCaloLayer_Y/2.-fCFFront_Y/2.;
  fPhysiCFFront_Z = fCaloLayer_Z/2. -fActiveLayer_Z/2.-fCFSuppPorV_Z/2.;

  fPhysiCFLat_X = fCaloLayer_X/2.-fCFLat_X/2.;
  fPhysiCFLat_Y = 0;
  fPhysiCFLat_Z =  fCaloLayer_Z/2. -fActiveLayer_Z/2. -fCFSuppPorV_Z/2.;

  fPhysiPoronLat_X = fCaloLayer_X/2. -fCFLat_X -fPoronLat_X/2.;
  fPhysiPoronLat_Y = 0;
  fPhysiPoronLat_Z = fCaloLayer_Z/2. -fActiveLayer_Z/2. -fCFSuppPorV_Z/2.;

  fPhysiPoronFront_X = 0;
  fPhysiPoronFront_Y = fCaloLayer_Y/2. -fCFFront_Y- fPoronFront_Y/2.;
  fPhysiPoronFront_Z =  fCaloLayer_Z/2. -fActiveLayer_Z/2. -fCFSuppPorV_Z/2.;

  ////////////////////////////

  fPhysiCFFrontPO_X = 0;
  fPhysiCFFrontPO_Y = fCaloLayer_Y/2.-fCFFront_Y/2.;
  fPhysiCFFrontPO_Z = fCaloLayer_Z/2. - fCFSuppPorV_Z/2. -fActiveLayer_Z -fCFSup
pPorV_Z - fCFSuppV_Z  ;

  fPhysiCFLatPO_X = fCaloLayer_X/2.-fCFLat_X/2.;
  fPhysiCFLatPO_Y = 0;
  fPhysiCFLatPO_Z = fCaloLayer_Z/2. - fCFSuppPorV_Z/2. -fActiveLayer_Z -fCFSuppP
orV_Z - fCFSuppV_Z  ;


  fPhysiPoronLatPO_X = fCaloLayer_X/2. -fCFLat_X -fPoronLat_X/2.;
  fPhysiPoronLatPO_Y = 0;
  fPhysiPoronLatPO_Z = fCaloLayer_Z/2. - fCFSuppPorV_Z/2. -fActiveLayer_Z -fCFSu
```

```
ppPorV_Z − fCFSuppV_Z  ;

  fPhysiPoronFrontPO_X = 0;
  fPhysiPoronFrontPO_Y = fCaloLayer_Y/2. −fCFFront_Y− fPoronFront_Y/2.;
  fPhysiPoronFrontPO_Z = fCaloLayer_Z/2. − fCFSuppPorV_Z/2. −fActiveLayer_Z −fCF
SuppPorV_Z − fCFSuppV_Z  ;

  fPhysiCrystalBox_X = 0;
  fPhysiCrystalBox_Y = 0;
  fPhysiCrystalBox_Z = −fCalo_Z/2. + fCrystal_Z/2.;

  fPhysiCFCrystalPanelUp_X = 0;
  fPhysiCFCrystalPanelUp_Y = 0;
  fPhysiCFCrystalPanelUp_Z = fCrystal_Z/2.−fCFCrystalPanelUp_Z/2.;


  fPhysiCFCrystalPanelDown_X = 0;
  fPhysiCFCrystalPanelDown_Y = 0;
  fPhysiCFCrystalPanelDown_Z = −fCrystal_Z/2. + fCFCrystalPanelDown_Z/2.;

  fPhysiCFCrystalPanelDown2_X = 0;
  fPhysiCFCrystalPanelDown2_Y = 0;
  fPhysiCFCrystalPanelDown2_Z = −fCalo_Z/2. − fCFCrystalPanelDown2_Z/2.;

  fPhysiCFCrystalSideX_X = fCrystal_X/2. −fCFCrystalSideX_X/2.;
  fPhysiCFCrystalSideX_Y = 0;
  fPhysiCFCrystalSideX_Z = −fCrystal_Z/2. + fCFCrystalPanelDown_Z + fCFCrystalSi
deYBig_Z/2.;

  fPhysiCFCrystalSideYBig_X = 0;
  fPhysiCFCrystalSideYBig_Y = fCrystal_Y/2.−fCFCrystalSideYBig_Y/2.;
  fPhysiCFCrystalSideYBig_Z = −fCrystal_Z/2. + fCFCrystalPanelDown_Z + fCFCrysta
lSideYBig_Z/2.;

  fPhysiCrystalBlockPlaneContainer_X = 0;
  fPhysiCrystalBlockPlaneContainer_Y = 0;
  fPhysiCrystalBlockPlaneContainer_Z = −fCrystal_Z/2. + fCFCrystalPanelDown_Z +
fCrystalBlockContainer_Z/2.;

  fPhysiLastSuppPor_X = 0;
  fPhysiLastSuppPor_Y = 0;
  fPhysiLastSuppPor_Z = +fCrystal_Z/2. −fCFSuppPorO_Z/2.;




  //////////  Bottom VETO
  fPhysiRealTrapCF_Z = −fCalo_Z/2.−23.4*mm−fTrapCFY1/2.;
  fPhysiRealTrapCF2_Z = −fCalo_Z/2.−23.4*mm −fTrapCFY1 −fTrapPoronY1−fTrapVetoY1
−fTrapPoronY1 −fTrapCFY1/2.;
  fPhysiRealTrapPoron1_Z = −fCalo_Z/2.−23.4*mm−fTrapCFY1−fTrapPoronY1−fTrapVetoY
1−fTrapPoronY1/2. ;
  fPhysiRealTrapPoron2_Z = −fCalo_Z/2.−23.4*mm−fTrapCFY1−fTrapPoronY1/2.;
  fPhysiRealTrapVeto_Z = −fCalo_Z/2.−23.4*mm−fTrapCFY1−fTrapPoronY1−fTrapVetoY1/
2.;
  ////////////////////////////////////

  fPhysiPoronLatX3_X = −4.5*mm;
  fPhysiPoronLatX3_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y+fVetoLatX_Y+fPoronL
atX_Y/2.;
  fPhysiPoronLatX3_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatY3_X =  fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X+fVetoLatY_X+fPoron
LatY_X/2.;
  fPhysiPoronLatY3_Y =  −4*mm;
  fPhysiPoronLatY3_Z =  −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatX3Int_X =  −4.5*mm;
  fPhysiPoronLatX3Int_Y =  fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y/2.;
```



```
  fPhysiPoronLatX3Int_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatY3Int_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X/2.;
  fPhysiPoronLatY3Int_Y =  −4*mm;
  fPhysiPoronLatY3Int_Z =  −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.;

  fPhysiVetoLatX2_X = (fVetoLatXRight_X − fVetoLatXLeft_X)/2.;    /// 4.5*mm;
  fPhysiVetoLatX2_Y = fCalo_Y/2. + fCFVetoLatX_Y +  fPoronLatX_Y + fVetoLatX_Y/2
. ;
  fPhysiVetoLatX2_Z = −fCalo_Z/2. −15.22*mm +fVetoLatY_Z/2.;

  fPhysiVetoLatY2_X = fCalo_X/2.+ fPoronLatY_X +fVetoLatY_X/2.+fCFVetoLatY_X;
  fPhysiVetoLatY2_Y = (fVetoLatYUp_Y − fVetoLatYDown_Y)/2.; //4*mm;
  fPhysiVetoLatY2_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.;

  fPhysiCFVetoLatX2_X = (fCFVetoLatXHole_X + fCFVetoLatXHoleRight_X)/2.;
  fPhysiCFVetoLatX2_Y =  fCalo_Y/2. + fCFVetoLatX_Y/2.;
  fPhysiCFVetoLatX2_Z = −fCalo_Z/2. −18.4*mm +fVetoLatY_Z/2.;

  fPhysiCFVetoLatY2_X =  fCalo_X/2.+fCFVetoLatY_X/2.;
  fPhysiCFVetoLatY2_Y = (fCFVetoLatYHole_Y + fCFVetoLatYHoleDown_Y)/2.; // 10.65
*mm;
  fPhysiCFVetoLatY2_Z =   −fCalo_Z/2. −18.4*mm+fVetoLatY_Z/2.;

  fPoronLat1X_X = fPoronLatX_X/2. +  fPoronLatXRight_X/2. ;
  fPoronLat1X_Z = −fPoronLatX_Z/2. + fPoronLatXRight_Z/2. ;

  fPoronLat2X_X = −fPoronLatX_X/2. −fPoronLatXHole_X/2. ; //−fPoronLatXRight_X/2
.
  fPoronLat2X_Z = fPoronLatX_Z/2. − fPoronLatXHole_Z/2. ;


  fPoronLat3X_X = −fPoronLatX_X/2. −fPoronLatXHole_X −fPoronLatXHoleLeft_X/2.; /
/−fPoronLatXRight_X/2.


  fVetoLat1X_X = fVetoLatX_X/2. + fVetoLatXRight_X/2.;
  fVetoLat1X_Z = −fVetoLatX_Z/2. + fVetoLatXRight_Z/2.;

  fVetoLat2X_X = −fVetoLatX_X/2. − fVetoLatXLeft_X/2.;
  fVetoLat2X_Z = fVetoLatX_Z/2. − fVetoLatXLeft_Z/2.;

  fCFVetoLat1X_X = − fCFVetoLatX_X/2. − fCFVetoLatXHole_X/2.;
  fCFVetoLat1X_Z =  fCFVetoLatX_Z/2. − fCFVetoLatXHole_Z/2.;


  fCFVetoLat2X_X = − fCFVetoLatX_X/2. − fCFVetoLatXHole_X −  fCFVetoLatXHoleRigh
t_X/2.;


  fPoronLat1Y_Y = fPoronLatY_Y/2. +  fPoronLatYUp_Y/2. ;
  fPoronLat1Y_Z = −fPoronLatY_Z/2. + fPoronLatYUp_Z/2. ;

  fPoronLat2Y_Y = −fPoronLatY_Y/2. −fPoronLatYHole_Y/2. ;
  fPoronLat2Y_Z = fPoronLatY_Z/2. − fPoronLatYHole_Z/2. ;


  fPoronLat3Y_Y = −fPoronLatY_Y/2. −  fPoronLatYHole_Y −  fPoronLatYHoleDown_Y/2
.;


  fVetoLat1Y_Y = fVetoLatY_Y/2. + fVetoLatYUp_Y/2.;
  fVetoLat1Y_Z = −fVetoLatY_Z/2. + fVetoLatYUp_Z/2.;

  fVetoLat2Y_Y = −fVetoLatY_Y/2. − fVetoLatYDown_Y/2.;
  fVetoLat2Y_Z = fVetoLatY_Z/2. − fVetoLatYDown_Z/2.;

  fCFVetoLat1Y_Y = − fCFVetoLatY_Y/2. − fCFVetoLatYHole_Y/2.;
  fCFVetoLat1Y_Z =  fCFVetoLatY_Z/2. − fCFVetoLatYHole_Z/2.;
```

```
  fCFVetoLat2Y_Y = - fCFVetoLatY_Y/2. - fCFVetoLatYHole_Y -  fCFVetoLatYHoleDown
_Y/2.;

  // Sbarre poron angoli calorimetro
  fPhysiExternalPoronSupport_X = fCalo_X/2.+ 25.06*mm - fExternalPoronSupport_X/
2.+7.265*mm;
  fPhysiExternalPoronSupport_Y =  fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y+fVetoLat
X_Y+fPoronLatX_Y - fExternalPoronSupportE_Y/2.;
  fPhysiExternalPoronSupport_Z =  -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;


  /*
  fPhysiPoronLatXInt_X = 0*mm;
  fPhysiPoronLatXInt_Y = fCalo_Y/2.+fPoronLatX_Y/2.;
  fPhysiPoronLatXInt_Z = 1.96*mm;


  fPhysiPoronLatXExt_X = -4.5*mm;
  fPhysiPoronLatXExt_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y+fVetoLatX_Y+fPoro
nLatX_Y/2.;
  fPhysiPoronLatXExt_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatXExtRight_X = -4.5*mm+fPoronLatX_X/2.+ fPoronLatXRight_X/2.;
  fPhysiPoronLatXExtRight_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y+fVetoLatX_Y+
fPoronLatX_Y/2.;
  fPhysiPoronLatXExtRight_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.-fPoronLatX_
Z/2+fPoronLatXRight_Z/2.;

  fPhysiPoronLatXExtHole_X = -4.5*mm- fPoronLatX_X/2. - fPoronLatXHole_X/2.;
  fPhysiPoronLatXExtHole_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y+fVetoLatX_Y+f
PoronLatX_Y/2.;
  fPhysiPoronLatXExtHole_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.+fPoronLatX_Z
/2-fPoronLatXHole_Z/2.;

  fPhysiPoronLatXExtHoleLeft_X =-4.5*mm - fPoronLatX_X/2. - fPoronLatXHole_X-fPo
ronLatXHoleLeft_X/2.;
  fPhysiPoronLatXExtHoleLeft_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y+fVetoLatX
_Y+fPoronLatX_Y/2.;
  fPhysiPoronLatXExtHoleLeft_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;
  */



  ///////  poron attorno Calorimetro interni - frontale
  /*
  fPhysiPoronLatXInt_X = -4.5*mm;
  fPhysiPoronLatXInt_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y/2.;
  fPhysiPoronLatXInt_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatXIntRight_X = -4.5*mm+fPoronLatX_X/2.+ fPoronLatXRight_X/2.;
  fPhysiPoronLatXIntRight_Y = fCalo_Y/2.+fPoronLatX_Y/2.+fCFVetoLatX_Y;
  fPhysiPoronLatXIntRight_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.-fPoronLatX_
Z/2+fPoronLatXRight_Z/2.;

  fPhysiPoronLatXIntHole_X = -4.5*mm- fPoronLatX_X/2. - fPoronLatXHole_X/2.;
  fPhysiPoronLatXIntHole_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y/2.;
  fPhysiPoronLatXIntHole_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.+fPoronLatX_Z
/2-fPoronLatXHole_Z/2.;

  fPhysiPoronLatXIntHoleLeft_X =-4.5*mm - fPoronLatX_X/2. - fPoronLatXHole_X-fPo
ronLatXHoleLeft_X/2.;
  fPhysiPoronLatXIntHoleLeft_Y = fCalo_Y/2.+fCFVetoLatX_Y+fPoronLatX_Y/2.;
  fPhysiPoronLatXIntHoleLeft_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatYInt_X = fCalo_X/2.+fPoronLatY_X/2.;
  fPhysiPoronLatYInt_Y = 0;
```



```
  fPhysiPoronLatYInt_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatYExt_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X+fVetoLatY_X+fPoro
nLatY_X/2.;
  fPhysiPoronLatYExt_Y = -4*mm;
  fPhysiPoronLatYExt_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatYExtUp_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X+fVetoLatY_X+fPo
ronLatY_X/2.;
  fPhysiPoronLatYExtUp_Y = fPoronLatY_Y/2.+fPoronLatYUp_Y/2.-4*mm;
  fPhysiPoronLatYExtUp_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.-fPoronLatY_Z/2
+fPoronLatYUp_Z/2.;

  fPhysiPoronLatYExtHole_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X+fVetoLatY_X+f
PoronLatY_X/2.;
  fPhysiPoronLatYExtHole_Y = -fPoronLatY_Y/2-fPoronLatYHole_Y/2.-4*mm;
  fPhysiPoronLatYExtHole_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.+fPoronLatY_Z
/2-fPoronLatYHole_Z/2.;

  fPhysiPoronLatYExtHoleDown_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X+fVetoLatY
_X+fPoronLatY_X/2.;
  fPhysiPoronLatYExtHoleDown_Y = -fPoronLatY_Y/2-fPoronLatYHole_Y - fPoronLatYHo
leDown_Y/2.-4*mm;
  fPhysiPoronLatYExtHoleDown_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;
  */
  ////////////////////// poron attorno Calorimetro interni - laterale

  /*
  fPhysiPoronLatYInt_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X/2.;
  fPhysiPoronLatYInt_Y = -4*mm;
  fPhysiPoronLatYInt_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;

  fPhysiPoronLatYIntUp_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X/2.;
  fPhysiPoronLatYIntUp_Y = fPoronLatY_Y/2.+fPoronLatYUp_Y/2.-4*mm;
  fPhysiPoronLatYIntUp_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.-fPoronLatY_Z/2
+fPoronLatYUp_Z/2.;

  fPhysiPoronLatYIntHole_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X/2.;
  fPhysiPoronLatYIntHole_Y = -fPoronLatY_Y/2-fPoronLatYHole_Y/2.-4*mm;
  fPhysiPoronLatYIntHole_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.+fPoronLatY_Z
/2-fPoronLatYHole_Z/2.;

  fPhysiPoronLatYIntHoleDown_X = fCalo_X/2.+fCFVetoLatY_X+fPoronLatY_X/2.;
  fPhysiPoronLatYIntHoleDown_Y = -fPoronLatY_Y/2-fPoronLatYHole_Y - fPoronLatYHo
leDown_Y/2.-4*mm;
  fPhysiPoronLatYIntHoleDown_Z = -fCalo_Z/2. -15.22*mm + fVetoLatY_Z/2.;

  ////////////////////////////// carbonio attorno al calorimetro

  fPhysiCFVetoLatX_X = +12.415*mm;
  fPhysiCFVetoLatX_Y = fCalo_Y/2. + fCFVetoLatX_Y/2.;
  fPhysiCFVetoLatX_Z = -fCalo_Z/2. -18.4*mm +fVetoLatY_Z/2.;

  fPhysiCFVetoLatXHole_X =  +12.415*mm - fCFVetoLatX_X/2. - fCFVetoLatXHole_X/2.
;
  fPhysiCFVetoLatXHole_Y =  fCalo_Y/2. + fCFVetoLatX_Y/2.;
  fPhysiCFVetoLatXHole_Z = -fCalo_Z/2. -18.4*mm +fVetoLatY_Z/2.+ fCFVetoLatX_Z/2
. - fCFVetoLatXHole_Z/2. ;


  fPhysiCFVetoLatXHoleRight_X = +12.415*mm - fCFVetoLatX_X/2. - fCFVetoLatXHole_
X - fCFVetoLatXHoleRight_X/2.;
  fPhysiCFVetoLatXHoleRight_Y =  fCalo_Y/2. + fCFVetoLatX_Y/2.;
  fPhysiCFVetoLatXHoleRight_Z = -fCalo_Z/2. -18.4*mm+fVetoLatY_Z/2.;

  fPhysiCFVetoLatY_X = fCalo_X/2.+fCFVetoLatY_X/2.;
  fPhysiCFVetoLatY_Y = 10.65*mm;
  fPhysiCFVetoLatY_Z =  -fCalo_Z/2. -18.4*mm+fVetoLatY_Z/2.;
```

```
  fPhysiCFVetoLatYHole_X = fCalo_X/2.+fCFVetoLatY_X/2.;
  fPhysiCFVetoLatYHole_Y = 10.65*mm − fCFVetoLatY_Y/2. − fCFVetoLatYHole_Y/2.;
  fPhysiCFVetoLatYHole_Z = −fCalo_Z/2. −18.4*mm +fVetoLatY_Z/2.+ fCFVetoLatY_Z/2
. −  fCFVetoLatYHole_Z/2.;


  fPhysiCFVetoLatYHoleDown_X = fCalo_X/2.+fCFVetoLatY_X/2.;
  fPhysiCFVetoLatYHoleDown_Y = 10.65*mm − fCFVetoLatY_Y/2. − fCFVetoLatYHole_Y −
 fCFVetoLatYHoleDown_Y/2.;
  fPhysiCFVetoLatYHoleDown_Z = −fCalo_Z/2. −18.4*mm+fVetoLatY_Z/2.;

  ////////////////////////////

  fPhysiVetoLatX_X = −4.5*mm;
  fPhysiVetoLatX_Y = fCalo_Y/2.+fPoronLatX_Y+fVetoLatX_Y/2.+fCFVetoLatX_Y;
  fPhysiVetoLatX_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.;

  fPhysiVetoLatXRight_X = +fVetoLatX_X/2.+fVetoLatXRight_X/2.−4.5*mm;
  fPhysiVetoLatXRight_Y = fCalo_Y/2.+fPoronLatX_Y+fVetoLatX_Y/2.+fCFVetoLatX_Y;
  fPhysiVetoLatXRight_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.−fVetoLatX_Z/2.+
fVetoLatXRight_Z/2.;

  fPhysiVetoLatXLeft_X = −fVetoLatX_X/2.−fVetoLatXLeft_X/2.−4.5*mm ;
  fPhysiVetoLatXLeft_Y = fCalo_Y/2.+fPoronLatX_Y+fVetoLatXLeft_Y/2.+fCFVetoLatX_
Y;
  fPhysiVetoLatXLeft_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.−fVetoLatXLeft_Z/
2.+fVetoLatX_Z/2.;

  fPhysiVetoLatY_X = fCalo_X/2.+fPoronLatY_X+fVetoLatY_X/2.+fCFVetoLatY_X;
  fPhysiVetoLatY_Y = −4*mm;
  fPhysiVetoLatY_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.;

  fPhysiVetoLatYUp_X = fCalo_X/2.+fPoronLatY_X+fVetoLatY_X/2.+fCFVetoLatY_X;
  fPhysiVetoLatYUp_Y = −4*mm+fVetoLatY_Y/2.+fVetoLatYUp_Y/2.;
  fPhysiVetoLatYUp_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.−fVetoLatY_Z/2+fVet
oLatYUp_Z/2;

  fPhysiVetoLatYDown_X = fCalo_X/2.+fPoronLatY_X+fVetoLatY_X/2.+fCFVetoLatY_X;
  fPhysiVetoLatYDown_Y = −4*mm−fVetoLatY_Y/2.−fVetoLatYDown_Y/2.;
  fPhysiVetoLatYDown_Z = −fCalo_Z/2. −15.22*mm + fVetoLatY_Z/2.+fVetoLatY_Z/2−fV
etoLatYDown_Z/2;;
  */
  ////////////////////////////////////////////




  fPhysiPoronPlateOTop_X = −fCFCrystalPanelDown_X/2. −1*mm +fPoronPlateO_X/2.;
  fPhysiPoronPlateOTop_Y = fCFCrystalPanelDown_Y/2. + 1*mm + fPoronPlateO_Y/2.;
  fPhysiPoronPlateOTop_Z = +fCalo_Z/2. +8.08*mm +fPoronPlateO_Z/2.;

  fPhysiPoronPlateVTop_X = −fCFCrystalPanelDown_X/2. −1*mm −fPoronPlateV_X/2.;
  fPhysiPoronPlateVTop_Y = fCFCrystalPanelDown_Y/2. +25.06*mm − fPoronPlateV_Y/2
.;
  fPhysiPoronPlateVTop_Z = +fCalo_Z/2. +8.08*mm +fPoronPlateO_Z/2.;



  fPhysiPoronPlateOBottom_X = +fCFCrystalPanelDown_X/2. +1*mm −fPoronPlateO_X/2.
;
  fPhysiPoronPlateOBottom_Y = fCFCrystalPanelDown_Y/2. + 1*mm + fPoronPlateO_Y/2
.;
  fPhysiPoronPlateOBottom_Z = −fCalo_Z/2. −15.22*mm −fPoronPlateO_Z/2. ;

  fPhysiPoronPlateVBottom_X = fCFCrystalPanelDown_X/2. +1*mm +fPoronPlateV_X/2.;
  fPhysiPoronPlateVBottom_Y = fCFCrystalPanelDown_Y/2. +25.06*mm − fPoronPlateV_
Y/2.;
  fPhysiPoronPlateVBottom_Z = −fCalo_Z/2. −15.22*mm −fPoronPlateV_Z/2.;
```



```


  fPhysiPORSuppTop_X = 0;
  fPhysiPORSuppTop_Y = 0;
  fPhysiPORSuppTop_Z = fCalo_Z/2.+ fCFSuppPorO_Z/2.;


  fPhysiCFSuppTop_X = 0;
  fPhysiCFSuppTop_Y = 0;
  fPhysiCFSuppTop_Z = fCalo_Z/2.+fCFSuppAO_Z/2. + fCFSuppPorO_Z;  // aggiungere
spessore croce poron

  fExternalPoronSupport1_X = −fExternalPoronSupportE_X/2.− fExternalPoronSupport
D_X/2.;
  fExternalPoronSupport1_Y = +fExternalPoronSupportE_Y/2.− fExternalPoronSupport
D_Y/2.;

  fExternalPoronSupport2_X = −fExternalPoronSupportE_X/2.− fExternalPoronSupport
D_X − fExternalPoronSupportC_X/2.;

  fExternalPoronSupport3_X = −fExternalPoronSupportE_X/2.− fExternalPoronSupport
D_X − fExternalPoronSupportC_X − fExternalPoronSupportB_X/2;
  fExternalPoronSupport3_Y = +fExternalPoronSupportC_Y/2.− fExternalPoronSupport
B_Y/2;

  fExternalPoronSupport4_X = −fExternalPoronSupportE_X/2.− fExternalPoronSupport
D_X − fExternalPoronSupportC_X − fExternalPoronSupportB_X − fExternalPoronSuppor
tA_X/2.;
  fExternalPoronSupport4_Y = +fExternalPoronSupportC_Y/2.− fExternalPoronSupport
A_Y/2;
  fExternalPoronSupport4_Z = +fExternalPoronSupportB_Z/2.− +fExternalPoronSuppor
tA_Z/2.;



}



//....oooOO0OOooo........oooOO0OOooo........oooOO0OOooo........oooOO0OOooo......

void CalorimeterConstructionConfig6::Builder(G4VPhysicalVolume* motherVolume)
{
  G4SDManager* SDman = G4SDManager::GetSDMpointer();
  G4String caloSDname = "/hepd/calorimeter";
  CalorimeterSD * caloSD = new CalorimeterSD(caloSDname);
  SDman->AddNewDetector(caloSD);

  G4String vetoSDname = "/hepd/veto";
  VetoSD * vetoSD = new VetoSD(vetoSDname);
  SDman->AddNewDetector(vetoSD);

  pMaterial->DefineMaterials();
  G4Material* vacuum          = pMaterial->GetMaterial("Galactic");
  G4Material* scintLayerMat   = pMaterial->GetMaterial(scintMaterial);
  G4Material* crystalLayerMat = pMaterial->GetMaterial(crystalMaterial);
  G4Material* vetoLayerMat    = pMaterial->GetMaterial(vetoMaterial);
  G4Material* cfMat           = pMaterial->GetMaterial(cfiberMaterial);
  G4Material* porMat          = pMaterial->GetMaterial(poronMaterial);
  //  G4Material* hcMat           = pMaterial->GetMaterial(honeycombMaterial);
  G4Material* teflon          = pMaterial->GetMaterial(teflonMaterial);



  // S1 scintillator
  fSolidS1 = new G4Box("S1",fS1_X/2.,fS1_Y/2.,fS1_Z/2.);

  fSolidS1SuppHoleBar = new G4Box("CFSupportHoleBar",fS1SuppHoleBar_X/2.,fS1SuppHol
eBar_Y/2.,fS1SuppHoleBar_Z/2.);
```

```
  fSolidS1SuppBar = new G4Box("CFSupportBar",fS1SuppBar_X/2.,fS1SuppBar_Y/2.,fS1Su
ppBar_Z/2.);

  fSolidS1SuppThinBar = new G4Box("CFSupportThinBar", fS1SuppThinBar_X/2., fS1SuppT
hinBar_Y/2.,fS1SuppThinBar_Z/2.);

  fSolidS1SuppThinBarBack = new G4Box("CFSupportThinBar", fS1SuppThinBarBack_X/2.,
fS1SuppThinBarBack_Y/2.,fS1SuppThinBarBack_Z/2.);

  fSolidS1SuppBack = new G4Box("CFSupportBack", fS1SuppBottom_X/2., fS1SuppBottom_
Y/2., fS1SuppBottom_Z/2.);

  fSolidS1SuppTopBase = new G4Box("CFSupport",fS1SuppTopBase_X/2.,fS1SuppTopBase_
Y/2.,fS1SuppTopBase_Z/2.);

  fSolidS1SuppTopHole = new G4Box("CFSupport",fS1SuppTopHole_X/2.,fS1SuppTopHole_
Y/2.,fS1SuppTopHole_Z/2.);

  fSolidS1SuppFrontTemp0 = new G4SubtractionSolid("CFSupport",fSolidS1SuppTopBase
,fSolidS1SuppTopHole,0,
                                                  G4ThreeVector(fSolidS1SuppFron
t_X,fSolidS1SuppFront_Y,fSolidS1SuppFront_Z));

  fSolidS1SuppFrontTemp1 = new G4SubtractionSolid("CFSupport",fSolidS1SuppFrontTe
mp0,fSolidS1SuppTopHole,0,
                                                  G4ThreeVector(-fSolidS1SuppFro
nt_X,fSolidS1SuppFront_Y,fSolidS1SuppFront_Z));

  fSolidS1SuppFrontTemp2 = new G4SubtractionSolid("CFSupport",fSolidS1SuppFrontTe
mp1,fSolidS1SuppTopHole,0,
                                                  G4ThreeVector(fSolidS1SuppFron
t_X,-fSolidS1SuppFront_Y,fSolidS1SuppFront_Z));

  fSolidS1SuppFront = new G4SubtractionSolid("CFSupport",fSolidS1SuppFrontTemp2,f
SolidS1SuppTopHole,0,
                                                G4ThreeVector(-fSolidS1SuppFront_X,
-fSolidS1SuppFront_Y,fSolidS1SuppFront_Z));

  fSolidS1SuppPoronFront = new G4Box("CFSupportPoron", fS1SuppPoron_X/2., fS1SuppP
oron_Y/2., fS1SuppPoron_Z/2.);


  fSolidS1ScintContainer = new G4Box("ScintContainer",fS1ScintContainer_X/2.,fS1Scin
tContainer_Y/2.,fS1ScintContainer_Z/2.);

  fSolidS1Scint = new G4Box("S1Scint",fS1Scint_X/2.,fS1Scint_Y/2.,fS1Scint_Z/2.);
  ////////////////////////////////////////////////////



  // Calorimeter
  fSolidCaloBox = new G4Box("Calorimeter",fCalo_X/2.,fCalo_Y/2.,fCalo_Z/2.);

  fSolidScintBox = new G4Box("CalorimeterScint",fScint_X/2.,fScint_Y/2.,fScint_Z/2.)
;

  fSolidCrystalBox = new G4Box("CalorimeterCrystal",fCrystal_X/2.,fCrystal_Y/2.,fCrys
tal_Z/2.);

  fSolidLayer = new G4Box("Layer",fCaloLayer_X/2.,fCaloLayer_Y/2.,fCaloLayer_Z/2.
);

  fSolidLastLayer = new G4Box("LastActiveLayer", fCaloLastLayer_X/2., fCaloLastLaye
r_Y/2., fCaloLastLayer_Z/2.);

  G4RotationMatrix * _rot90 = new G4RotationMatrix;
  G4RotationMatrix * _rot45 = new G4RotationMatrix;
  G4RotationMatrix * _rot180 = new G4RotationMatrix;
```



```
  G4RotationMatrix * _rotminus90 = new G4RotationMatrix;
  G4RotationMatrix * _rot180Z = new G4RotationMatrix;
  G4RotationMatrix * _rot180Y = new G4RotationMatrix;
  G4RotationMatrix * _rot180ZY = new G4RotationMatrix;

  _rot90->rotateX(90 * deg);
  _rot45->rotateX(90 * deg);
  _rot45->rotateY(-45 * deg);
  _rotminus90->rotateX(-90 * deg);
  _rot180->rotateX(180 * deg);
  _rot180Z->rotateZ(180 * deg);
  _rot180Y->rotateY(180 * deg);
  _rot180ZY->rotateY(180 * deg);
  _rot180ZY->rotateZ(180 * deg);


  fSolidActiveTrapLayer = new G4Trap ("TrapezoidalLayer", fActiveTrapLayerX1/2., fAc
tiveTrapLayerX2/2., fActiveTrapLayerY1/2., fActiveTrapLayerY2/2., fActiveTrapLay
erZ/2.);

  fSolidActiveRectLayer = new G4Box("RectangularLayer", fActiveRectLayer_X/2.,fActiv
eRectLayer_Y/2.,fActiveRectLayer_Z/2.);

  fSolidActiveLayer_1 = new G4UnionSolid("ActiveLayer1",  fSolidActiveRectLayer,
fSolidActiveTrapLayer, _rot90, G4ThreeVector(0, fActiveLayer_Y/2. -fActiveTrapLa
yerZ/2. ,0));

  fSolidActiveLayer = new G4UnionSolid("ActiveLayer", fSolidActiveLayer_1,  fSolid
ActiveTrapLayer, _rotminus90, G4ThreeVector(0, -fActiveLayer_Y/2. + fActiveTrapL
ayerZ/2. ,0));


  fSolidTrapPoronLayer = new G4Trap ("TrapPoronLayer", fTrapPoronX1/2., fTrapPoron
X2/2.,fTrapPoronY1/2.,fTrapPoronY2/2.,fTrapPoronZ/2.);

  fSolidRealTrapPoronLayer = new G4UnionSolid("RealTrapPoronLayer",fSolidTrapPoronL
ayer,fSolidTrapPoronLayer, _rot180,G4ThreeVector(0,0,-fTrapPoronZ));

  fSolidTrapVetoLayer = new G4Trap ("TrapPoronLayer", fTrapVetoX1/2., fTrapVetoX2/
2.,fTrapVetoY1/2.,fTrapVetoY2/2.,fTrapVetoZ/2.);

  fSolidRealTrapVetoLayer = new G4UnionSolid("RealTrapVetoLayer",fSolidTrapVetoLaye
r,fSolidTrapVetoLayer, _rot180,G4ThreeVector(0,0,-fTrapVetoZ));

  fSolidTrapCFLayer = new G4Trap ("TrapPoronLayer", fTrapCFX1/2., fTrapCFX2/2.,fTr
apCFY1/2.,fTrapCFY2/2.,fTrapCFZ/2.);

  fSolidRealTrapCFLayer = new G4UnionSolid("RealTrapCFLayer",fSolidTrapCFLayer,fSo
lidTrapCFLayer, _rot180,G4ThreeVector(0,0,-fTrapCFZ));

  fSolidExternalPoronSupportA = new G4Box("ExternalPoronSupportA", fExternalPoronSup
portA_X/2.,fExternalPoronSupportA_Y/2.,fExternalPoronSupportA_Z/2.);

  fSolidExternalPoronSupportB = new G4Box("ExternalPoronSupportB", fExternalPoronSup
portB_X/2.,fExternalPoronSupportB_Y/2.,fExternalPoronSupportB_Z/2.);

  fSolidExternalPoronSupportC = new G4Box("ExternalPoronSupportC", fExternalPoronSup
portC_X/2.,fExternalPoronSupportC_Y/2.,fExternalPoronSupportC_Z/2.);

  fSolidExternalPoronSupportD = new G4Box("ExternalPoronSupportD", fExternalPoronSup
portD_X/2.,fExternalPoronSupportD_Y/2.,fExternalPoronSupportD_Z/2.);

  fSolidExternalPoronSupportE = new G4Box("ExternalPoronSupportE", fExternalPoronSupp
ortE_X/2.,fExternalPoronSupportE_Y/2.,fExternalPoronSupportE_Z/2.);

  fSolidExternalPoronSupport1 = new G4UnionSolid("ExternalPoronSupport1",fSolidExtern
alPoronSupportE,fSolidExternalPoronSupportD,0,G4ThreeVector(fExternalPoronSuppor
t1_X,fExternalPoronSupport1_Y,0));
```

```
  fSolidExternalPoronSupport2 = new G4UnionSolid("ExternalPoronSupport2",fSolidExtern
alPoronSupport1,fSolidExternalPoronSupportC,0,G4ThreeVector(fExternalPoronSuppor
t2_X,0,0));

  fSolidExternalPoronSupport3 = new G4UnionSolid("ExternalPoronSupport3",fSolidExtern
alPoronSupport2,fSolidExternalPoronSupportB,0,G4ThreeVector(fExternalPoronSuppor
t3_X,fExternalPoronSupport3_Y,0));

  fSolidExternalPoronSupport =  new G4UnionSolid("ExternalPoronSupport",fSolidExterna
lPoronSupport3,fSolidExternalPoronSupportA,0,G4ThreeVector(fExternalPoronSupport
4_X,fExternalPoronSupport4_Y,fExternalPoronSupport4_Z));

  fSolidTeflonLYSO = new G4Box("TeflonLYSO",fTeflonLYSO_X/2.,fTeflonLYSO_Y/2.,fTe
flonLYSO_Z/2.);

  fSolidCFBlockContainer = new G4SubtractionSolid("CFBlockContainer",fSolidCFBlockC
ontainerExt,fSolidCFBlockContainerInt);

  fSolidSingleCrystalBlockContainer = new G4Box("SingleCrystalBlockContainer",fCFBlockC
ontainerExt_X/2.,fCFBlockContainerExt_Y/2.,fCFBlockContainerExt_Z/2.);

  fSolidCrystalActiveBlock = new G4Box("CrystalActiveBlock",fCrystalBlock_X/2.,fCrys
talBlock_Y/2.,fCrystalBlock_Z/2.);

  fSolidTeflonContainerExt = new G4Box("TeflonContainerExt",TeflonContainerExt_X/2.,
TeflonContainerExt_Y/2.,TeflonContainerExt_Z/2.);

  fSolidTeflonContainer = new G4SubtractionSolid("TeflonContainer",fSolidTeflonCont
ainerExt,fSolidCrystalActiveBlock);

  fSolidCFCrystalPanelDown = new G4Box("CFCrystalPanelDown",fCFCrystalPanelDown_X/2
.,fCFCrystalPanelDown_Y/2.,fCFCrystalPanelDown_Z/2);

  fSolidCylinderPanelDown = new G4Cons("CylinderPanelDown", fCylinderRadiusMin1,  f
CylinderRadiusMax1, fCylinderRadiusMin2, fCylinderRadiusMax2, fCylinderZ/2., 8 ,
8);

  fSolidCFCrystalPanelDownTemp = new G4Box("CFCrystalPanelDown2",fCFCrystalPanelDow
n2_X/2., fCFCrystalPanelDown2_Y/2.,fCFCrystalPanelDown2_Z/2.);

  fSolidCFCrystalPanelDownHole = new G4Box("CFCrystalHole",fCFCrystalHole_X/2.,fCF
CrystalHole_Y/2.,fCFCrystalHole_Z/2.);

  fSolidPoronPlateO = new G4Box("PoronPlateO", fPoronPlateO_X/2., fPoronPlateO_Y/2
.,  fPoronPlateO_Z/2. );

  fSolidPoronPlateV = new G4Box("PoronPlateV", fPoronPlateV_X/2. ,fPoronPlateV_Y/2
. ,fPoronPlateV_Z/2. );


  G4double nholes = 3;
  G4double posX[3];
  G4double posY[3];
  G4double holeDist = 37.7*mm;
  G4double holeDist2 = 50.8*mm;

  posX[0] = -fCFCrystalPanelDown_X/2.+ holeDist ;
  posY[0] = -fCFCrystalPanelDown_Y/2.+ holeDist ;
  for (G4int i = 1; i < nholes; i++) {
    posX[i] = posX[0]+ i*holeDist2;
    posY[i] = posY[0]+ i*holeDist2;
  }

  fSolidCylinderPanelDown1 = new G4SubtractionSolid("Hole0", fSolidCFCrystalPane
lDown,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[0], posY[0], 0));
  fSolidCylinderPanelDown2 = new G4SubtractionSolid("Hole1", fSolidCylinderPanel
Down1,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[0], posY[1], 0));
  fSolidCylinderPanelDown3 = new G4SubtractionSolid("Hole2", fSolidCylinderPanel
Down2,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[0], posY[2], 0));
```



```
  fSolidCylinderPanelDown4 = new G4SubtractionSolid("Hole3", fSolidCylinderPanel
Down3,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[1], posY[0], 0));
  fSolidCylinderPanelDown5 = new G4SubtractionSolid("Hole4", fSolidCylinderPanel
Down4,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[1], posY[1], 0));
  fSolidCylinderPanelDown6 = new G4SubtractionSolid("Hole5", fSolidCylinderPanel
Down5,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[1], posY[2], 0));
  fSolidCylinderPanelDown7 = new G4SubtractionSolid("Hole6", fSolidCylinderPanel
Down6,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[2], posY[0], 0));
  fSolidCylinderPanelDown8 = new G4SubtractionSolid("Hole7", fSolidCylinderPanel
Down7,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[2], posY[1], 0));
  fSolidPanelDown          = new G4SubtractionSolid("Hole8", fSolidCylinderPanel
Down8,  fSolidCylinderPanelDown, 0, G4ThreeVector(posX[2], posY[2], 0));


  G4double posSquareX[3];
  G4double posSquareY[3];
  G4double squareDist = 6*mm;

  posSquareX[0] = -fCFCrystalPanelDown2_X/2. + squareDist + fCFCrystalHole_X/2;
  posSquareY[0] = -fCFCrystalPanelDown2_Y/2. + squareDist + fCFCrystalHole_Y/2;

  for (G4int j = 1; j < nholes; j++) {
    posSquareX[j] = posSquareX[0]+ j*(squareDist+ fCFCrystalHole_X/2);
    posSquareY[j] = posSquareY[0]+ j*(squareDist+ fCFCrystalHole_Y/2 );
  }

  fSolidSquarePanelDown1 = new G4SubtractionSolid("SquadreHole0", fSolidCFCrystalP
anelDownTemp, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[0], posY[0], 0
));
  fSolidSquarePanelDown2 = new G4SubtractionSolid("SquadreHole1", fSolidSquarePane
lDown1, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[0], posY[1], 0));
  fSolidSquarePanelDown3 = new G4SubtractionSolid("SquadreHole2", fSolidSquarePane
lDown2, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[0], posY[2], 0));
  fSolidSquarePanelDown4 = new G4SubtractionSolid("SquadreHole3", fSolidSquarePane
lDown3, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[1], posY[0], 0));
  fSolidSquarePanelDown5 = new G4SubtractionSolid("SquadreHole4", fSolidSquarePane
lDown4, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[1], posY[1], 0));
  fSolidSquarePanelDown6 = new G4SubtractionSolid("SquadreHole5", fSolidSquarePane
lDown5, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[1], posY[2], 0));
  fSolidSquarePanelDown7 = new G4SubtractionSolid("SquadreHole6", fSolidSquarePane
lDown6, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[2], posY[0], 0));
  fSolidSquarePanelDown8 = new G4SubtractionSolid("SquadreHole7", fSolidSquarePane
lDown7, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[2], posY[1], 0));
  fSolidPanelDown2          = new G4SubtractionSolid("SquadreHole8", fSolidSquareP
anelDown8, fSolidCFCrystalPanelDownHole, 0, G4ThreeVector(posX[2], posY[2], 0));



  fSolidCrystalBlockContainer = new G4Box("CrystalBlockContainer",fCrystalBlockContai
ner_X/2.,fCrystalBlockContainer_Y/2.,fCrystalBlockContainer_Z/2.);

  fSolidCrystalBlockRawContainer = new G4Box("CrystalBlockRawContainer",fCrystalBlock
RawContainer_X/2.,fCrystalBlockRawContainer_Y/2.,fCrystalBlockRawContainer_Z/2.)
;
  fSolidCFCrystalSideX = new G4Box("CFCrystalSideX",fCFCrystalSideX_X/2.,fCFCrysta
lSideX_Y/2.,fCFCrystalSideX_Z/2.);

  fSolidCFCrystalSideYBig = new G4Box("CFCrystalSideYBig",fCFCrystalSideYBig_X/2.,f
CFCrystalSideYBig_Y/2.,fCFCrystalSideYBig_Z/2.);

  fSolidCFFront = new  G4Box("CFSupport",fCFFront_X/2.,fCFFront_Y/2.,fCFFront_Z/2
.);

  fSolidCFLat = new  G4Box("CFSupport",fCFLat_X/2.,fCFLat_Y/2.,fCFLat_Z/2.);

  fSolidCFFrontPO = new  G4Box("CFSupportPO",fCFFrontPO_X/2.,fCFFrontPO_Y/2.,fCFF
rontPO_Z/2.);

  fSolidCFLatPO = new  G4Box("CFSupportPO",fCFLatPO_X/2.,fCFLatPO_Y/2.,fCFLatPO_Z
```

```
/2.);

  fSolidCFSuppO = new G4Box("CFSupport",fCFSuppO_X/2.,fCFSuppO_Y/2.,fCFSuppO_Z/2.
);

  fSolidCFSuppV = new G4Box("CFSupport",fCFSuppV_X/2.,fCFSuppV_Y/2.,fCFSuppV_Z/2.
);

  fSolidCFSuppOA = new G4Box("CFSupportTop",fCFSuppAO_X/2.,fCFSuppAO_Y/2.,fCFSupp
AO_Z/2.);

  fSolidCFSuppVA = new G4Box("CFSupportTop",fCFSuppAV_X/2.,fCFSuppAV_Y/2.,fCFSupp
AV_Z/2.);

  fSolidCFSuppLat = new G4Box("CFSupport",fCFSuppLat_X/2.,fCFSuppLat_Y/2.,fCFSupp
Lat_Z/2.);

  fSolidCFSuppLatA = new G4Box("CFSupportTop",fCFSuppLatA_X/2.,fCFSuppLatA_Y/2.,f
CFSuppLatA_Z/2.);

  fSolidCFSuppFront = new G4Box("CFSupport",fCFSuppFront_X/2.,fCFSuppFront_Y/2.,f
CFSuppFront_Z/2.);

  fSolidCFSuppFrontA = new G4Box("CFSupportTop",fCFSuppFrontA_X/2.,fCFSuppFrontA_
Y/2.,fCFSuppFrontA_Z/2.);

  fSolidCFSuppPorO = new G4Box("PORSupport",fCFSuppPorO_X/2.,fCFSuppPorO_Y/2.,fCF
SuppPorO_Z/2.);

  fSolidCFSuppPorV = new G4Box("PORSupport",fCFSuppPorV_X/2.,fCFSuppPorV_Y/2.,fCF
SuppPorV_Z/2.);

  fSolidCFSuppPoron = new G4UnionSolid("PORSupport",fSolidCFSuppPorO, fSolidCFSup
pPorV);    // creazione croce poron

  fSolidCFSuppStepOV = new G4UnionSolid("CFSupport",fSolidCFSuppO,fSolidCFSuppV);
    // creazione croce carbonio

  fSolidCFSuppStepOVA = new G4UnionSolid("CFSupportTop",fSolidCFSuppOA,fSolidCFSu
ppVA);    // creazione croce carbonio

  fSolidCFSuppStepLat1 = new G4UnionSolid("CFSupport",fSolidCFSuppStepOV,fSolidCF
SuppLat,0,    // aggiunta blocchi ai lati della croce
                                          G4ThreeVector(fSolidCFSuppStepLat_X,fS
olidCFSuppStepLat_Y,fSolidCFSuppStepLat_Z));

  fSolidCFSuppStepLat2 = new G4UnionSolid("CFSupport",fSolidCFSuppStepLat1,fSolid
CFSuppLat,0,
                                         G4ThreeVector(-fSolidCFSuppStepLat_X,f
SolidCFSuppStepLat_Y,fSolidCFSuppStepLat_Z));

  fSolidCFSuppStepFront1 = new G4UnionSolid("CFSupport",fSolidCFSuppStepLat2,fSol
idCFSuppFront,0,
                                           G4ThreeVector(fSolidCFSuppStepFront_
X,fSolidCFSuppStepFront_Y,fSolidCFSuppStepFront_Z));

  fSolidCFSupp = new G4UnionSolid("CFSupport",fSolidCFSuppStepFront1,fSolidCFSupp
Front,0,
                                 G4ThreeVector(fSolidCFSuppStepFront_X,-fSolidC
FSuppStepFront_Y,fSolidCFSuppStepFront_Z));

  fSolidCFSuppStepLat1A = new G4UnionSolid("CFSupportTop",fSolidCFSuppStepOVA,fSo
lidCFSuppLatA,0,
                                          G4ThreeVector(fSolidCFSuppStepLat_X,f
SolidCFSuppStepLat_Y,fSolidCFSuppStepLat_Z));

  fSolidCFSuppStepLat2A = new G4UnionSolid("CFSupportTop",fSolidCFSuppStepLat1A,f
SolidCFSuppLatA,0,
                                          G4ThreeVector(-fSolidCFSuppStepLat_X,
```



```
fSolidCFSuppStepLat_Y,fSolidCFSuppStepLat_Z));

  fSolidCFSuppStepFront1A = new G4UnionSolid("CFSupportTop",fSolidCFSuppStepLat2A
,fSolidCFSuppFrontA,0,
                                             G4ThreeVector(fSolidCFSuppStepFront
_X,fSolidCFSuppStepFront_Y,fSolidCFSuppStepFront_Z));

  fSolidCFSuppA = new G4UnionSolid("CFSupporTop",fSolidCFSuppStepFront1A,fSolidCF
SuppFrontA,0,
                                   G4ThreeVector(fSolidCFSuppStepFront_X,-fSolid
CFSuppStepFront_Y,fSolidCFSuppStepFront_Z));

  fSolidPoronLat = new G4Box("Poron",fPoronLat_X/2.,fPoronLat_Y/2.,fPoronLat_Z/2.
);

  fSolidPoronFront = new G4Box("Poron",fPoronFront_X/2.,fPoronFront_Y/2.,fPoronFr
ont_Z/2.);

  fSolidPoronLatPO = new G4Box("PoronPO",fPoronLatPO_X/2.,fPoronLatPO_Y/2.,fPoro
nLatPO_Z/2.);

  fSolidPoronFrontPO = new G4Box("PoronPO",fPoronFrontPO_X/2.,fPoronFrontPO_Y/2.
,fPoronFrontPO_Z/2.);









  // VETO STRUCTURES
  fSolidPoronLatX = new G4Box("Poron",fPoronLatX_X/2.,fPoronLatX_Y/2.,fPoronLatX_
Z/2.);

  fSolidPoronLatXRight = new G4Box("Poron",fPoronLatXRight_X/2.,fPoronLatXRight_Y
/2.,fPoronLatXRight_Z/2.);

  fSolidPoronLatXHole = new G4Box("Poron",fPoronLatXHole_X/2.,fPoronLatXHole_Y/2.
,fPoronLatXHole_Z/2.);

  fSolidPoronLatXHoleLeft = new G4Box("Poron",fPoronLatXHoleLeft_X/2.,fPoronLatXH
oleLeft_Y/2.,fPoronLatXHoleLeft_Z/2.);

  fSolidPoronLatX_1 = new G4UnionSolid("SolidPoronLatX_1",fSolidPoronLatX ,fSolidPo
ronLatXRight,0,G4ThreeVector(fPoronLat1X_X,0,fPoronLat1X_Z));

  fSolidPoronLatX_2 = new G4UnionSolid("SolidPoronLatX_2",fSolidPoronLatX_1 ,fSolid
PoronLatXHole,0,G4ThreeVector(fPoronLat2X_X,0,fPoronLat2X_Z));

  fSolidPoronLatX_3 = new G4UnionSolid("SolidPoronLatX_3",fSolidPoronLatX_2 ,fSolid
PoronLatXHoleLeft,0,G4ThreeVector(fPoronLat3X_X,0,0));

  fSolidVetoLatX = new G4Box("Veto",fVetoLatX_X/2.,fVetoLatX_Y/2.,fVetoLatX_Z/2.
);

  fSolidVetoLatXRight = new G4Box("Veto",fVetoLatXRight_X/2.,fVetoLatXRight_Y/2.
,fVetoLatXRight_Z/2.);

  fSolidVetoLatXLeft = new G4Box("Veto",fVetoLatXLeft_X/2.,fVetoLatXLeft_Y/2.,fV
etoLatXLeft_Z/2.);

  fSolidVetoLatX_1 = new G4UnionSolid("SolidVetoLatX_1",fSolidVetoLatX ,fSolidVetoL
atXRight,0,G4ThreeVector(fVetoLat1X_X,0,fVetoLat1X_Z));

  fSolidVetoLatX_2 = new G4UnionSolid("SolidVetoLatX_2",fSolidVetoLatX_1 ,fSolidVet
oLatXLeft,0,G4ThreeVector(fVetoLat2X_X,0,fVetoLat2X_Z));

  fSolidPoronLatY = new G4Box("Poron",fPoronLatY_X/2.,fPoronLatY_Y/2.,fPoronLatY_
Z/2.);
```

```
  fSolidPoronLatYUp = new G4Box("Poron",fPoronLatYUp_X/2.,fPoronLatYUp_Y/2.,fPoro
nLatYUp_Z/2.);

  fSolidPoronLatYHole = new G4Box("Poron",fPoronLatYHole_X/2.,fPoronLatYHole_Y/2.
,fPoronLatYHole_Z/2.);

  fSolidPoronLatYHoleDown = new G4Box("Poron",fPoronLatYHoleDown_X/2.,fPoronLatYH
oleDown_Y/2.,fPoronLatYHoleDown_Z/2.);

  fSolidPoronLatY_1 = new G4UnionSolid("SolidPoronLatY_1",fSolidPoronLatY ,fSolidPo
ronLatYUp,0,G4ThreeVector(0, fPoronLat1Y_Y, fPoronLat1Y_Z));

  fSolidPoronLatY_2 = new G4UnionSolid("SolidPoronLatY_2",fSolidPoronLatY_1 ,fSolid
PoronLatYHole,0,G4ThreeVector(0, fPoronLat2Y_Y, fPoronLat2Y_Z));

  fSolidPoronLatY_3 = new G4UnionSolid("SolidPoronLatY_3",fSolidPoronLatY_2 ,fSolid
PoronLatYHoleDown,0,G4ThreeVector(0,fPoronLat3Y_Y,0));

  fSolidVetoLatY = new G4Box("Veto",fVetoLatY_X/2.,fVetoLatY_Y/2.,fVetoLatY_Z/2.
);

  fSolidVetoLatYUp = new G4Box("Veto",fVetoLatYUp_X/2.,fVetoLatYUp_Y/2.,fVetoLat
YUp_Z/2.);

  fSolidVetoLatYDown = new G4Box("Veto",fVetoLatYDown_X/2.,fVetoLatYDown_Y/2.,fV
etoLatYDown_Z/2.);

  fSolidVetoLatY_1 = new G4UnionSolid("SolidVetoLatX_1",fSolidVetoLatY ,fSolidVetoL
atYUp,0,G4ThreeVector(0,fVetoLat1Y_Y, fVetoLat1Y_Z));

  fSolidVetoLatY_2 = new G4UnionSolid("SolidVetoLatX_2",fSolidVetoLatY_1 ,fSolidVet
oLatYDown,0,G4ThreeVector(0,fVetoLat2Y_Y,fVetoLat2Y_Z));

  fSolidCFVetoLatX = new G4Box("CFSupport",fCFVetoLatX_X/2.,fCFVetoLatX_Y/2.,fCFV
etoLatX_Z/2.);

  fSolidCFVetoLatXHole = new G4Box("CFSupport",fCFVetoLatXHole_X/2.,fCFVetoLatXHo
le_Y/2.,fCFVetoLatXHole_Z/2.);

  fSolidCFVetoLatXHoleRight = new G4Box("CFSupport",fCFVetoLatXHoleRight_X/2.,fCF
VetoLatXHoleRight_Y/2.,fCFVetoLatXHoleRight_Z/2.);

  fSolidCFVetoLatX_1 = new G4UnionSolid("SolidCFLatX_1",fSolidCFVetoLatX , fSolidC
FVetoLatXHole,0,G4ThreeVector(fCFVetoLat1X_X,0,fCFVetoLat1X_Z));

  fSolidCFVetoLatX_2 = new G4UnionSolid("SolidCFLatX_2",fSolidCFVetoLatX_1 , fSoli
dCFVetoLatXHoleRight,0,G4ThreeVector(fCFVetoLat2X_X,0,0));

  fSolidCFVetoLatY = new G4Box("CFSupport",fCFVetoLatY_X/2.,fCFVetoLatY_Y/2.,fCFV
etoLatY_Z/2.);

  fSolidCFVetoLatYHole = new G4Box("CFSupport",fCFVetoLatYHole_X/2.,fCFVetoLatYHo
le_Y/2.,fCFVetoLatYHole_Z/2.);

  fSolidCFVetoLatYHoleDown = new G4Box("CFSupport",fCFVetoLatYHoleDown_X/2.,fCFVe
toLatYHoleDown_Y/2.,fCFVetoLatYHoleDown_Z/2.);

  fSolidCFVetoLatY_1 = new G4UnionSolid("SolidCFLatY_1",fSolidCFVetoLatY , fSolidC
FVetoLatYHole,0,G4ThreeVector(0, fCFVetoLat1Y_Y ,fCFVetoLat1Y_Z));

  fSolidCFVetoLatY_2 = new G4UnionSolid("SolidCFLatX_2",fSolidCFVetoLatY_1 , fSoli
dCFVetoLatYHoleDown,0,G4ThreeVector(0, fCFVetoLat2Y_Y, 0));
  ////////////////////////////////////
```



```
  //fSolidHoneyCombLatY = new G4Box("HoneyCombCore",fHoneyCombLatY_X/2.,fHoneyCo
mbLatY_Y/2.,fHoneyCombLatY_Z/2.);

  //fSolidHoneyCombSkinLatY = new G4Box("HoneyCombSkin",fHoneyCombSkinLatY_X/2.,
fHoneyCombSkinLatY_Y/2.,fHoneyCombSkinLatY_Z/2.);

  //fSolidHoneyCombLatX = new G4Box("HoneyCombCore",fHoneyCombLatX_X/2.,fHoneyCo
mbLatX_Y/2.,fHoneyCombLatX_Z/2.);

  //fSolidHoneyCombSkinLatX = new G4Box("HoneyCombSkin",fHoneyCombSkinLatX_X/2.,
fHoneyCombSkinLatX_Y/2.,fHoneyCombSkinLatX_Z/2.);

  //fSolidHoneyCombBottom = new G4Box("HoneyCombCore",fHoneyCombBottom_X/2.,fHon
eyCombBottom_Y/2.,fHoneyCombBottom_Z/2.);

  //  fSolidHoneyCombSkinBottom = new G4Box("HoneyCombSkin",fHoneyCombSkinBottom
_X/2.,fHoneyCombSkinBottom_Y/2.,fHoneyCombSkinBottom_Z/2.);




  // S1 Scintillator
  fLogicS1 = new G4LogicalVolume(fSolidS1,vacuum,"S1");

  fLogicS1SuppBack = new G4LogicalVolume(fSolidS1SuppBack,cfMat,"S1SupportBack");

  fLogicS1SuppHoleBar = new G4LogicalVolume(fSolidS1SuppHoleBar,cfMat,"S1SupportH
oleBar");

  fLogicS1SuppBar = new G4LogicalVolume(fSolidS1SuppBar,cfMat,"S1SupportBar");

  fLogicS1SuppThinBar = new G4LogicalVolume(fSolidS1SuppThinBar,cfMat,"S1SupportTh
inBar");

  fLogicS1SuppThinBarBack = new G4LogicalVolume(fSolidS1SuppThinBarBack,cfMat,"S
1SupportThinBarBack");

  fLogicS1SuppFront = new G4LogicalVolume(fSolidS1SuppFront,cfMat,"S1SupportFront")
;

  fLogicS1SuppPoronFront = new G4LogicalVolume(fSolidS1SuppPoronFront,porMat,"S1
SupportPoronFront");

  fLogicS1ScintContainerP = new G4LogicalVolume(fSolidS1ScintContainer,vacuum,"S
1ScintContainer1");

  fLogicS1ScintContainerM = new G4LogicalVolume(fSolidS1ScintContainer,vacuum,"S
1ScintContainer2");

  fLogicS1Scint = new G4LogicalVolume(fSolidS1Scint,scintLayerMat,"S1Scint");
  ////////////////////////////


  // Calorimeter
  fLogicCaloBox = new G4LogicalVolume(fSolidCaloBox,vacuum,"Calorimeter");

  fLogicScintBox = new G4LogicalVolume(fSolidScintBox,vacuum,"CalorimeterScint");

  fLogicCrystalBox = new G4LogicalVolume(fSolidCrystalBox,vacuum,"CalorimeterCrystal"
);

  fLogicScintLayer = new G4LogicalVolume(fSolidLayer,vacuum,"LayerScint");

  fLogicLastScintLayer = new G4LogicalVolume(fSolidLastLayer,vacuum,"LastLayerScint
");

  fLogicScintActiveLayer = new G4LogicalVolume(fSolidActiveLayer,scintLayerMat,"
ActiveLayerScint");
```

```
  fLogicRealTrapPoronLayer = new G4LogicalVolume(fSolidRealTrapPoronLayer,porMat
,"RealTrapPoronLayer");

  fLogicRealTrapVetoLayer = new G4LogicalVolume(fSolidRealTrapVetoLayer,vetoLaye
rMat,"RealTrapVetoLayer");

  fLogicRealTrapCFLayer = new G4LogicalVolume(fSolidRealTrapCFLayer,cfMat,"RealTr
apCFLayer");

  fLogicExternalPoronSupport = new G4LogicalVolume(fSolidExternalPoronSupport,po
rMat,"ExternalPoronSupport");

  fLogicTeflonLYSO =  new G4LogicalVolume(fSolidTeflonLYSO,vacuum,"TeflonLYSO");

  fLogicCrystalBlockContainer = new G4LogicalVolume(fSolidSingleCrystalBlockCont
ainer,vacuum,"SingleCrystalBlockContainer");

  fLogicCrystalBlockPlaneContainer = new G4LogicalVolume(fSolidCrystalBlockConta
iner,vacuum,"CrystalBlockPlane");

  fLogicCrystalBlockRawContainer = new G4LogicalVolume(fSolidCrystalBlockRawCont
ainer,vacuum,"CrystalBlockRaw");

  fLogicCrystalActiveBlock = new G4LogicalVolume(fSolidCrystalActiveBlock,crysta
lLayerMat,"CrystalActiveBlock");

  fLogicCFCrystalPanelDown = new G4LogicalVolume(fSolidPanelDown, cfMat, "CFSupp
ort");

  fLogicCFCrystalPanelDown2 = new G4LogicalVolume(fSolidPanelDown2, cfMat, "CFSu
pport");

  fLogicCFBlockContainer = new G4LogicalVolume(fSolidCFBlockContainer,cfMat,"CFS
upport");

  fLogicTeflonContainer = new G4LogicalVolume(fSolidTeflonContainer,teflon,"Teflo
nLayer");//////////////////////////////////////

  fLogicCFCrystalSideX = new G4LogicalVolume(fSolidCFCrystalSideX,cfMat,"CFSuppor
t");

  fLogicCFCrystalSideYBig = new G4LogicalVolume(fSolidCFCrystalSideYBig,cfMat,"
CFSupport");

  fLogicCFFront = new G4LogicalVolume(fSolidCFFront,cfMat,"CFSupport");

  fLogicCFLat = new G4LogicalVolume(fSolidCFLat,cfMat,"CFSupport");

  fLogicCFFrontPO = new G4LogicalVolume(fSolidCFFrontPO,cfMat,"CFSupportPO");

  fLogicCFLatPO = new G4LogicalVolume(fSolidCFLatPO,cfMat,"CFSupportPO");

  fLogicCFSuppPoron = new G4LogicalVolume(fSolidCFSuppPoron, porMat,"PORSupport")
;

  fLogicCFSupp = new G4LogicalVolume(fSolidCFSupp,cfMat,"CFSupport");

  fLogicCFSuppTop = new G4LogicalVolume(fSolidCFSuppA,cfMat,"CFSupportTop");

  fLogicPoronLat = new G4LogicalVolume(fSolidPoronLat,porMat,"Poron");

  fLogicPoronFront = new G4LogicalVolume(fSolidPoronFront,porMat,"Poron");

  fLogicPoronLatPO = new G4LogicalVolume(fSolidPoronLatPO,porMat,"PoronPO");

  fLogicPoronFrontPO = new G4LogicalVolume(fSolidPoronFrontPO,porMat,"PoronPO");
```



```
  // vecchi VETO
  //   fLogicPoronLatX = new G4LogicalVolume(fSolidPoronLatX,porMat,"Poron");

  //   fLogicPoronLatXRight = new G4LogicalVolume(fSolidPoronLatXRight,porMat,"P
oron");

  //   fLogicPoronLatXHole = new G4LogicalVolume(fSolidPoronLatXHole,porMat,"Por
on");

  //   fLogicPoronLatXHoleLeft = new G4LogicalVolume(fSolidPoronLatXHoleLeft,por
Mat,"Poron");




  // GOOD VETO
  fLogicPoronLatX = new G4LogicalVolume(fSolidPoronLatX_3,porMat,"Poron");

  fLogicPoronLatY = new G4LogicalVolume(fSolidPoronLatY_3,porMat,"Poron");

  fLogicVetoLatX = new G4LogicalVolume(fSolidVetoLatX_2,vetoLayerMat,"Veto");

  fLogicVetoLatX2 = new G4LogicalVolume(fSolidVetoLatX_2,vetoLayerMat,"Veto");

  fLogicVetoLatY = new G4LogicalVolume(fSolidVetoLatY_2,vetoLayerMat,"Veto");

  fLogicVetoLatY2 = new G4LogicalVolume(fSolidVetoLatY_2,vetoLayerMat,"Veto");

  fLogicCFVetoLatX = new G4LogicalVolume(fSolidCFVetoLatX_2,cfMat,"CFSupport");

  fLogicCFVetoLatY = new G4LogicalVolume(fSolidCFVetoLatY_2, cfMat,"CFSupport");
  ////////////////////



  // vecchi veto
  //fLogicVetoLatX = new G4LogicalVolume(fSolidVetoLatX,vetoLayerMat,"Veto");

  //fLogicVetoLatXRight = new G4LogicalVolume(fSolidVetoLatXRight,vetoLayerMat,"
Veto");

  //fLogicVetoLatXLeft = new G4LogicalVolume(fSolidVetoLatXLeft,vetoLayerMat,"Ve
to");

  //fLogicPoronLatY = new G4LogicalVolume(fSolidPoronLatY,porMat,"Poron");

  //fLogicPoronLatYUp = new G4LogicalVolume(fSolidPoronLatYUp,porMat,"Poron");

  //fLogicPoronLatYHole = new G4LogicalVolume(fSolidPoronLatYHole,porMat,"Poron"
);

  //fLogicPoronLatYHoleDown = new G4LogicalVolume(fSolidPoronLatYHoleDown,porMat
,"Poron");

  //fLogicVetoLatY = new G4LogicalVolume(fSolidVetoLatY,vetoLayerMat,"Veto");

  //fLogicVetoLatYUp = new G4LogicalVolume(fSolidVetoLatYUp,vetoLayerMat,"Veto")
;

  //fLogicVetoLatYDown = new G4LogicalVolume(fSolidVetoLatYDown,vetoLayerMat,"Ve
to");

  //fLogicCFVetoLatX = new G4LogicalVolume(fSolidCFVetoLatX,cfMat,"CFSupport");

  //fLogicCFVetoLatXHole = new G4LogicalVolume(fSolidCFVetoLatXHole,cfMat,"CFSup
port");

  //fLogicCFVetoLatXHoleRight = new G4LogicalVolume(fSolidCFVetoLatXHoleRight,cf
```

```
Mat,"CFSupport");

  //  fLogicCFVetoLatY = new G4LogicalVolume(fSolidCFVetoLatY,cfMat,"CFSupport")
;

  //  fLogicCFVetoLatYHole = new G4LogicalVolume(fSolidCFVetoLatYHole,cfMat,"CFS
upport");

  //fLogicCFVetoLatYHoleDown = new G4LogicalVolume(fSolidCFVetoLatYHoleDown,cfMa
t,"CFSupport");

  fLogicPoronPlateO = new G4LogicalVolume(fSolidPoronPlateO, porMat, "PoronPlateO"
);

  fLogicPoronPlateV = new G4LogicalVolume(fSolidPoronPlateV, porMat, "PorPlateV");

  //fLogicHoneyCombLatY = new G4LogicalVolume(fSolidHoneyCombLatY,hcMat,"HoneyCo
mbCore");

  //fLogicHoneyCombSkinLatY = new G4LogicalVolume(fSolidHoneyCombSkinLatY,cfMat,
"HoneyCombSkin");

  //fLogicHoneyCombLatX = new G4LogicalVolume(fSolidHoneyCombLatX,hcMat,"HoneyCo
mbCore");

  //fLogicHoneyCombSkinLatX = new G4LogicalVolume(fSolidHoneyCombSkinLatX,cfMat,
"HoneyCombSkin");

  //  fLogicHoneyCombBottom = new G4LogicalVolume(fSolidHoneyCombBottom,hcMat,"H
oneyCombCore");

  //fLogicHoneyCombSkinBottom = new G4LogicalVolume(fSolidHoneyCombSkinBottom,cf
Mat,"HoneyCombSkin");


  fLogicScintActiveLayer->SetSensitiveDetector(caloSD);
  fLogicCrystalActiveBlock->SetSensitiveDetector(caloSD);
  fLogicS1Scint->SetSensitiveDetector(caloSD);

  fLogicRealTrapVetoLayer->SetSensitiveDetector(vetoSD);
  fLogicVetoLatX->SetSensitiveDetector(vetoSD);
  fLogicVetoLatX2->SetSensitiveDetector(vetoSD);
  fLogicVetoLatY->SetSensitiveDetector(vetoSD);
  fLogicVetoLatY2->SetSensitiveDetector(vetoSD);
  // bisogna separare i due piani




  fPhysiS1 = new G4PVPlacement(0,
                               G4ThreeVector(fPhysiS1_X,fPhysiS1_Y,fPhysiS1_Z +
ShiftOrigin ),
                               "S1",
                               fLogicS1,
                               motherVolume,
                               false,
                               0,true);


  fPhysiS1SuppBack = new G4PVPlacement(0,
                                       G4ThreeVector(fPhysiS1SuppBack_X, fPhysiS
1SuppBack_Y, fPhysiS1SuppBack_Z),
                                       "S1SupportBack",
                                       fLogicS1SuppBack,
                                       fPhysiS1,
                                       false,
                                       0,true);
```



```
  fPhysiS1SuppHoleBar = new G4PVPlacement(0,
                                          G4ThreeVector( fPhysiS1SuppHoleBar_X ,
 fPhysiS1SuppHoleBar_Y, fPhysiS1SuppHoleBar_Z),
                                          "S1SupportHoleBar",
                                          fLogicS1SuppHoleBar,
                                          fPhysiS1,
                                          false,
                                          0,true);

  fPhysiS1SuppBar1 = new G4PVPlacement(0,
                                       G4ThreeVector( fPhysiS1SuppBar_X , fPhysi
S1SuppBar_Y, fPhysiS1SuppBar_Z),
                                       "S1SupportBar1",
                                       fLogicS1SuppBar,
                                       fPhysiS1,
                                       false,
                                       0,true);

  fPhysiS1SuppBar2 = new G4PVPlacement(0,
                                       G4ThreeVector( fPhysiS1SuppBar_X , -fPhys
iS1SuppBar_Y, fPhysiS1SuppBar_Z),
                                       "S1SupportBar2",
                                       fLogicS1SuppBar,
                                       fPhysiS1,
                                       false,
                                       0,true);

  fPhysiS1SuppThinBar1 = new G4PVPlacement(0,
                                           G4ThreeVector(fPhysiS1SuppThinBar_X,
fPhysiS1SuppThinBar_Y, fPhysiS1SuppThinBar_Z),
                                           "S1SupportThinBar1",
                                           fLogicS1SuppThinBar,
                                           fPhysiS1,
                                           false,
                                           0,true);

  fPhysiS1SuppThinBarBack1 = new G4PVPlacement(0,
                                               G4ThreeVector(fPhysiS1SuppThinBar
Back_X, fPhysiS1SuppThinBarBack_Y, fPhysiS1SuppThinBarBack_Z),
                                               "S1SupportThinBarBack1",
                                               fLogicS1SuppThinBarBack,

                                               fPhysiS1,
                                               false,
                                               0,true);


  fPhysiS1SuppFrontM = new G4PVPlacement(0,
                                         G4ThreeVector(fPhysiS1SuppFrontM_X,fPhy
siS1SuppFrontM_Y,fPhysiS1SuppFrontM_Z),
                                         "S1SupportM",
                                         fLogicS1SuppFront,
                                         fPhysiS1,
                                         false,
                                         0,true);

  fPhysiS1SuppFrontPoronM = new G4PVPlacement(0,
                                              G4ThreeVector(fPhysiS1SuppPoronFro
ntM_X,fPhysiS1SuppPoronFrontM_Y,fPhysiS1SuppPoronFrontM_Z),
                                              "S1SupportPoronM",
                                              fLogicS1SuppPoronFront,

                                              fPhysiS1,
                                              false,
                                              0,true);



  fPhysiS1SuppThinBar2 = new G4PVPlacement(0,
```

```
                                        G4ThreeVector(-fPhysiS1SuppThinBar_X,
 fPhysiS1SuppThinBar_Y, fPhysiS1SuppThinBar_Z),
                                        "S1SupportThinBar2",
                                        fLogicS1SuppThinBar,
                                        fPhysiS1,
                                        false,
                                        0,true);

  fPhysiS1SuppThinBarBack2 = new G4PVPlacement(0,
                                         G4ThreeVector(-fPhysiS1SuppThinBa
rBack_X, fPhysiS1SuppThinBarBack_Y, fPhysiS1SuppThinBarBack_Z),
                                         "S1SupportThinBarBack2",
                                         fLogicS1SuppThinBarBack,

                                         fPhysiS1,
                                         false,
                                         0,true);

  fPhysiS1ScintContainerP = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiS1ScintContain
er_X,fPhysiS1ScintContainer_Y,fPhysiS1ScintContainer_Z),
                                        "S1ContainerP",
                                        fLogicS1ScintContainerP,
                                        fPhysiS1,
                                        false,0,true);

  fPhysiS1ScintContainerM = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiS1ScintContain
er_X,-fPhysiS1ScintContainer_Y,fPhysiS1ScintContainer_Z),
                                        "S1ContainerM",
                                        fLogicS1ScintContainerM,
                                        fPhysiS1,
                                        false,0,true);

  fPhysiS1ScintP = new G4PVReplica("S1ScintillatorP",
                                   fLogicS1Scint,
                                   fPhysiS1ScintContainerP,
                                   kYAxis,
                                   fS1ScintNumber/2.,
                                   fS1Scint_Y);

  fPhysiS1ScintM = new G4PVReplica("S1ScintillatorM",
                                   fLogicS1Scint,
                                   fPhysiS1ScintContainerM,
                                   kYAxis,
                                   fS1ScintNumber/2.,
                                   fS1Scint_Y);
  ////////////////////////////////////////////////////


  // CALO

  fPhysiCaloBox = new G4PVPlacement(0,
                                    G4ThreeVector(0,0,ShiftOrigin),
                                    "Calorimeter",
                                    fLogicCaloBox,
                                    motherVolume,
                                    false,
                                    0,true);

  fPhysiScintBox = new G4PVPlacement(0,
                                     G4ThreeVector(fPhysiScintBox_X,fPhysiScintB
ox_Y,fPhysiScintBox_Z),
                                     "CalorimeterScint",
                                     fLogicScintBox,
                                     fPhysiCaloBox,
                                     false,
                                     0,true);
```



```
  fPhysiScintLayer = new G4PVReplica("LayerScint",
                                     fLogicScintLayer,
                                     fPhysiScintBox,
                                     kZAxis,
                                     fNbOfReplicatedScintLayers,
                                     fCaloLayer_Z);

  fPhysiLastScintLayer = new G4PVPlacement(0,
                                           G4ThreeVector(fPhysiLastScintLayer_X,
fPhysiLastScintLayer_Y,fPhysiLastScintLayer_Z),
                                           "LastScintLayer",
                                           fLogicLastScintLayer,
                                           fPhysiCaloBox,
                                           false,
                                           0,true);




  // piani scintillatore
  fPhysiScintActiveLayer = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiActiveLayer_X,f
PhysiActiveLayer_Y,fPhysiActiveLayer_Z),
                                             "ActiveLayerScint",
                                             fLogicScintActiveLayer,
                                             fPhysiScintLayer,
                                             false,
                                             0,true);



  /*#######################  Costole Poron angoli calorimetro ###################
##############*/
  fPhysiExternalPoronSupport1 = new G4PVPlacement(0,
                                                 G4ThreeVector(fPhysiExternalPo
ronSupport_X,fPhysiExternalPoronSupport_Y,fPhysiExternalPoronSupport_Z + ShiftOr
igin),
                                                 "ExternalPoronBar1",
                                                 fLogicExternalPoronSupport,
                                                 motherVolume,
                                                 false,
                                                 0,true);


  fPhysiExternalPoronSupport2 = new G4PVPlacement(_rot180Y,
                                                  G4ThreeVector(-fPhysiExternalP
oronSupport_X,fPhysiExternalPoronSupport_Y,fPhysiExternalPoronSupport_Z + ShiftO
rigin),
                                                  "ExternalPoronBar2",
                                                  fLogicExternalPoronSupport,
                                                  motherVolume,
                                                  false,
                                                  0,true);


  fPhysiExternalPoronSupport3 = new G4PVPlacement(_rot180ZY,
                                                  G4ThreeVector(fPhysiExternalPo
ronSupport_X,-fPhysiExternalPoronSupport_Y,fPhysiExternalPoronSupport_Z + ShiftO
rigin),
                                                  "ExternalPoronBar3",
                                                  fLogicExternalPoronSupport,
                                                  motherVolume,
                                                  false,
                                                  0,true);


  fPhysiExternalPoronSupport4 = new G4PVPlacement(_rot180Z,
                                                  G4ThreeVector(-fPhysiExternalP
oronSupport_X,-fPhysiExternalPoronSupport_Y,fPhysiExternalPoronSupport_Z + Shift
Origin),
```

```
                                                "ExternalPoronBar4",
                                                fLogicExternalPoronSupport,
                                                motherVolume,
                                                false,
                                                0,true);


  ////////////////////////////////////


  // croce di poron
  fPhysiScintCFSupp = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiCFSuppPor_X, fPhysiC
FSuppPor_Y, fPhysiCFSuppPor_Z ),
                                        "PORSupport_1",
                                        fLogicCFSuppPoron,
                                        fPhysiScintLayer,
                                        false,
                                        0,true);

  // croce di carbonio
  fPhysiScintCFSupp = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiCFSupp_X,fPhysiCFSup
p_Y,fPhysiCFSupp_Z),
                                        "CFSupport",
                                        fLogicCFSupp,
                                        fPhysiScintLayer,
                                        false,
                                        0,true);

  // croce di poron 2
  fPhysiScintCFSupp = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiCFSuppPor2_X, fPhysi
CFSuppPor2_Y, fPhysiCFSuppPor2_Z),
                                        "PORSupport_2",
                                        fLogicCFSuppPoron,
                                        fPhysiScintLayer,
                                        false,
                                        0,true);



  // blocco carbonio sopra piano scint
  fPhysiScintCFFrontP = new G4PVPlacement(0,
                                          G4ThreeVector(fPhysiCFFront_X,fPhysiCF
Front_Y,fPhysiCFFront_Z),
                                          "CFSupportFP",
                                          fLogicCFFront,
                                          fPhysiScintLayer,
                                          false,
                                          0,true);
  // blocco carbonio sotto piano scint
  fPhysiScintCFFrontM = new G4PVPlacement(0,
                                          G4ThreeVector(fPhysiCFFront_X,-fPhysiC
FFront_Y,fPhysiCFFront_Z),
                                          "CFSupportFM",
                                          fLogicCFFront,
                                          fPhysiScintLayer,
                                          false,
                                          0,true);
  // blocco carbonio destra piano scint
  fPhysiScintCFLatP = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiCFLat_X,fPhysiCFLat_
Y,fPhysiCFLat_Z),
                                        "CFSupportLP",
                                        fLogicCFLat,
                                        fPhysiScintLayer,
                                        false,
                                        0,true);
```



```
  // blocco carbonio sinistra piano scint
  fPhysiScintCFLatM = new G4PVPlacement(0,
                                        G4ThreeVector(-fPhysiCFLat_X,fPhysiCFLat
_Y,fPhysiCFLat_Z),
                                        "CFSupportLM",
                                        fLogicCFLat,
                                        fPhysiScintLayer,
                                        false,
                                        0,true);

  // poron parete laterale, sinistra piano scint
  fPhysiScintPoronLatP = new G4PVPlacement(0,
                                           G4ThreeVector(fPhysiPoronLat_X,fPhysi
PoronLat_Y,fPhysiPoronLat_Z),
                                           "PoronLP",
                                           fLogicPoronLat,
                                           fPhysiScintLayer,
                                           false,
                                           0,true);

  // poron parete laterla, destra piano scint

  fPhysiScintPoronLatM = new G4PVPlacement(0,
                                           G4ThreeVector(-fPhysiPoronLat_X,fPhys
iPoronLat_Y,fPhysiPoronLat_Z),
                                           "PoronLM",
                                           fLogicPoronLat,
                                           fPhysiScintLayer,
                                           false,
                                           0,true);

  // poron parete sopra piano scint
  fPhysiScintPoronLatUp = new G4PVPlacement(0,
                                            G4ThreeVector(fPhysiPoronFront_X,-fP
hysiPoronFront_Y,fPhysiPoronFront_Z),
                                            "PoronFP",
                                            fLogicPoronFront,
                                            fPhysiScintLayer,
                                            false,
                                            0,true);

  //poron parete sotto piano scint
  fPhysiScintPoronLatDown = new G4PVPlacement(0,
                                              G4ThreeVector(fPhysiPoronFront_X,f
PhysiPoronFront_Y,fPhysiPoronFront_Z),
                                              "PoronFM",
                                              fLogicPoronFront,
                                              fPhysiScintLayer,
                                              false,
                                              0,true);

  // blocco carbonio sopra croce poron
  fPhysiScintCFFrontPPO = new G4PVPlacement(0,
                                            G4ThreeVector(fPhysiCFFrontPO_X,fPhy
siCFFrontPO_Y,fPhysiCFFrontPO_Z),
                                            "CFSupportFPsmall",
                                            fLogicCFFrontPO,
                                            fPhysiScintLayer,
                                            false,
                                            0,true);
  // blocco carbonio sotto croce  poron
  fPhysiScintCFFrontMPO = new G4PVPlacement(0,
                                            G4ThreeVector(fPhysiCFFrontPO_X,-fPh
ysiCFFrontPO_Y,fPhysiCFFrontPO_Z),
                                            "CFSupportFMsmall",
                                            fLogicCFFrontPO,
                                            fPhysiScintLayer,
                                            false,
                                            0,true);
```

```
  // blocco carbonio destra croce poron
  fPhysiScintCFLatPPO = new G4PVPlacement(0,
                                          G4ThreeVector(fPhysiCFLatPO_X,fPhysiCF
LatPO_Y,fPhysiCFLatPO_Z),
                                          "CFSupportLPsmall",
                                          fLogicCFLatPO,
                                          fPhysiScintLayer,
                                          false,
                                          0,true);
  // blocco carbonio sinistra croce poron
  fPhysiScintCFLatMPO = new G4PVPlacement(0,
                                          G4ThreeVector(-fPhysiCFLatPO_X,fPhysiC
FLatPO_Y,fPhysiCFLatPO_Z),
                                          "CFSupportLMsmall",
                                          fLogicCFLatPO,
                                          fPhysiScintLayer,
                                          false,
                                          0,true);

  // poron parete laterale sinistra croce poron
  fPhysiScintPoronLatPPO = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiPoronLatPO_X,fP
hysiPoronLatPO_Y,fPhysiPoronLatPO_Z),
                                             "PoronLPsmall",
                                             fLogicPoronLatPO,
                                             fPhysiScintLayer,
                                             false,
                                             0,true);

  // poron parete laterla destra croce poron
  fPhysiScintPoronLatMPO = new G4PVPlacement(0,
                                             G4ThreeVector(-fPhysiPoronLatPO_X,f
PhysiPoronLatPO_Y,fPhysiPoronLatPO_Z),
                                             "PoronLMsmall",
                                             fLogicPoronLatPO,
                                             fPhysiScintLayer,
                                             false,
                                             0,true);
  // poron parete sopra croce poron
  fPhysiScintPoronLatUpPO = new G4PVPlacement(0,
                                              G4ThreeVector(fPhysiPoronFrontPO_X
,-fPhysiPoronFrontPO_Y,fPhysiPoronFrontPO_Z),
                                              "PoronFPsmall",
                                              fLogicPoronFrontPO,
                                              fPhysiScintLayer,
                                              false,
                                              0,true);
  // poron parete sotto croce poron
  fPhysiScintPoronLatDownPO = new G4PVPlacement(0,
                                                G4ThreeVector(fPhysiPoronFrontPO
_X,fPhysiPoronFrontPO_Y,fPhysiPoronFrontPO_Z),
                                                "PoronFMsmall",
                                                fLogicPoronFrontPO,
                                                fPhysiScintLayer,
                                                false,
                                                0,true);



  /*###################################    Ultimo piano di scintillatore plastic
o    ####################################################*/

  fPhysiScintActiveLayer = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiActiveLayer_X,f
PhysiActiveLayer_Y,fPhysiActiveLayer_Z-fPoronFrontPO_Z/2.),
                                             // G4ThreeVector(0 , 0 , 0),
                                             "ActiveLastLayerScint",
                                             fLogicScintActiveLayer,
                                             fPhysiLastScintLayer,
```



```
                                             false,
                                             0,true);
  // croce di poron
  fPhysiScintCFSupp = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiCFSuppPor_X, fPhysiC
FSuppPor_Y, fPhysiCFSuppPor_Z-fPoronFrontPO_Z/2. ),
                                        "PORSupport_1",
                                        fLogicCFSuppPoron,
                                        fPhysiLastScintLayer,
                                        false,
                                        0,true);
  // croce di carbonio
  fPhysiScintCFSupp = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiCFSupp_X,fPhysiCFSup
p_Y,fPhysiCFSupp_Z-fPoronFrontPO_Z/2.),
                                        "CFSupport",
                                        fLogicCFSupp,
                                        fPhysiLastScintLayer,
                                        false,
                                        0,true);


  // blocco carbonio sopra piano scint
  fPhysiScintCFFrontP = new G4PVPlacement(0,
                                          G4ThreeVector(fPhysiCFFront_X,fPhysiCF
Front_Y,fPhysiCFFront_Z-fPoronFrontPO_Z/2.),
                                          "CFSupportFP",
                                          fLogicCFFront,
                                          fPhysiLastScintLayer,
                                          false,
                                          0,true);
  // blocco carbonio sotto piano scint
  fPhysiScintCFFrontM = new G4PVPlacement(0,
                                          G4ThreeVector(fPhysiCFFront_X,-fPhysiC
FFront_Y,fPhysiCFFront_Z-fPoronFrontPO_Z/2.),
                                          "CFSupportFM",
                                          fLogicCFFront,
                                          fPhysiLastScintLayer,
                                          false,
                                          0,true);
  // blocco carbonio destra piano scint
  fPhysiScintCFLatP = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiCFLat_X,fPhysiCFLat_
Y,fPhysiCFLat_Z-fPoronFrontPO_Z/2.),
                                        "CFSupportLP",
                                        fLogicCFLat,
                                        fPhysiLastScintLayer,
                                        false,
                                        0,true);

  // blocco carbonio sinistra piano scint
  fPhysiScintCFLatM = new G4PVPlacement(0,
                                        G4ThreeVector(-fPhysiCFLat_X,fPhysiCFLat
_Y,fPhysiCFLat_Z-fPoronFrontPO_Z/2.),
                                        "CFSupportLM",
                                        fLogicCFLat,
                                        fPhysiLastScintLayer,
                                        0,true);

  // poron parete laterale, destra piano scint

  fPhysiScintPoronLatM = new G4PVPlacement(0,
                                           G4ThreeVector(-fPhysiPoronLat_X, fPhy
siPoronLat_Y, fPhysiPoronLat_Z-fPoronFrontPO_Z/2.),
                                           "PoronLM",
                                           fLogicPoronLat,
                                           fPhysiLastScintLayer,
                                           false,
                                           0,true);
  // poron parete sotto piano scint
```

```
  fPhysiScintPoronLatDown = new G4PVPlacement(0,
                                              G4ThreeVector(fPhysiPoronFront_X,
fPhysiPoronFront_Y, fPhysiPoronFront_Z-fPoronFrontPO_Z/2.),
                                              "PoronFP",
                                              fLogicPoronFront,
                                              fPhysiLastScintLayer,
                                              false,
                                              0,true);
  // poron parete laterale, sinistra piano scint

  fPhysiScintPoronLatP = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiPoronLat_X, fPhys
iPoronLat_Y, fPhysiPoronLat_Z-fPoronFrontPO_Z/2.),
                                             "PoronLP",
                                             fLogicPoronLat,
                                             fPhysiLastScintLayer,
                                             false,
                                             0,true);
  // poron parete sopra piano scint
  fPhysiScintPoronLatUp = new G4PVPlacement(0,
                                              G4ThreeVector(-fPhysiPoronFront_X, -
fPhysiPoronFront_Y, fPhysiPoronFront_Z-fPoronFrontPO_Z/2.),
                                              "PoronFM",
                                              fLogicPoronFront,
                                              fPhysiLastScintLayer,
                                              false,
                                              0,true);



  /*#########################################################################
#########################################################*/

  /* ################################     Cristalli di LYSO     ###############
###################*/

  fPhysiCrystalBox = new G4PVPlacement(0,
                                       G4ThreeVector(fPhysiCrystalBox_X,fPhysiCr
ystalBox_Y,fPhysiCrystalBox_Z),
                                       "CalorimeterCrystal",
                                       fLogicCrystalBox,
                                       fPhysiCaloBox,
                                       false,
                                       0,true);

  fPhysiCFCrystalPanelDown = new G4PVPlacement(0, // piano carbonio dopo LYSO
                                               G4ThreeVector(fPhysiCFCrystalPane
lDown_X,fPhysiCFCrystalPanelDown_Y,fPhysiCFCrystalPanelDown_Z),
                                               "CFSupportPlaneDown",
                                               fLogicCFCrystalPanelDown,
                                               fPhysiCrystalBox,
                                               false,
                                               0,true);

  fPhysiCFCrystalPanelDown2 = new G4PVPlacement(0, // secondo piano carbonio dop
o LYSO
                                                G4ThreeVector(fPhysiCFCrystalPan
elDown2_X,fPhysiCFCrystalPanelDown2_Y, fPhysiCFCrystalPanelDown2_Z + ShiftOrigin
),
                                                "CFSupportPlaneDown2",
                                                fLogicCFCrystalPanelDown2,
                                                motherVolume,
                                                false,
                                                0,true);



  fPhysiCFCrystalSideXP = new G4PVPlacement(0,  // costole intorno al LYSO
                                            G4ThreeVector(fPhysiCFCrystalSideX_X
,fPhysiCFCrystalSideX_Y,fPhysiCFCrystalSideX_Z),
                                            "CFSuportSideXP",
```



```
                                            fLogicCFCrystalSideX,
                                            fPhysiCrystalBox,
                                            false,
                                            0,true);

  fPhysiCFCrystalSideXM = new G4PVPlacement(0,  // costole intorno al LYSO
                                            G4ThreeVector(-fPhysiCFCrystalSideX_
X,fPhysiCFCrystalSideX_Y,fPhysiCFCrystalSideX_Z),
                                            "CFSuportSideXM",
                                            fLogicCFCrystalSideX,
                                            fPhysiCrystalBox,
                                            false,
                                            0,true);

  fPhysiCFCrystalSideYBigP = new G4PVPlacement(0, // costole intorno al LYSO
                                               G4ThreeVector(fPhysiCFCrystalSide
YBig_X,fPhysiCFCrystalSideYBig_Y,fPhysiCFCrystalSideYBig_Z),
                                               "CFSuportSideYBigP",
                                               fLogicCFCrystalSideYBig,
                                               fPhysiCrystalBox,
                                               false,
                                               0,true);

  fPhysiCFCrystalSideYBigM = new G4PVPlacement(0,  // costole intorno al LYSO
                                               G4ThreeVector(-fPhysiCFCrystalSid
eYBig_X,-fPhysiCFCrystalSideYBig_Y,fPhysiCFCrystalSideYBig_Z),
                                               "CFSuportSideYBigM",
                                               fLogicCFCrystalSideYBig,
                                               fPhysiCrystalBox,
                                               false,
                                               0,true);

  fPhysiCrystalBlockPlaneContainer = new G4PVPlacement(0,
                                                       G4ThreeVector(fPhysiCryst
alBlockPlaneContainer_X,fPhysiCrystalBlockPlaneContainer_Y,fPhysiCrystalBlockPla
neContainer_Z),
                                                       "CristalBlockPlaneContainer",
                                                       fLogicCrystalBlockPlaneCo
ntainer,
                                                       fPhysiCrystalBox,
                                                       false,
                                                       0,true);
  fPhysiScintCFSupp = new G4PVPlacement(0,  // croce poron attaccata al LYSO
                                        G4ThreeVector(fPhysiLastSuppPor_X, fPhys
iLastSuppPor_Y, fPhysiLastSuppPor_Z ),
                                        "PORLastSupport",
                                        fLogicCFSuppPoron,
                                        fPhysiCrystalBox,
                                        false,
                                        0,true);


  fPhysiCrystalBlockRaw = new G4PVReplica("CrystalBlockRaw",
                                          fLogicCrystalBlockRawContainer,

                                          fPhysiCrystalBlockPlaneContainer,
                                          kYAxis,
                                          3,
                                          fCrystalBlockRawContainer_Y);

  fPhysiTeflonLYSO = new G4PVReplica("CrystalBlock",
                                     fLogicTeflonLYSO,
                                     fPhysiCrystalBlockRaw,
                                     kXAxis,
                                     3,
                                     fCFBlockContainerExt_X);


  fPhysiCrystalActiveBlock = new G4PVPlacement(0,
```

```
                                                  G4ThreeVector(0 , 0 ,0),
                                                  "ActiveBlockCrystal",
                                                  fLogicCrystalActiveBlock,
                                                  fPhysiTeflonLYSO,
                                                  false,
                                                  0,true);
  fPhysiTeflonContainer = new G4PVPlacement(0,
                                            G4ThreeVector(0,0,0),
                                            "Teflon",
                                            fLogicTeflonContainer,
                                            fPhysiTeflonLYSO,
                                            false,
                                            0,true);



  /*##############################################################################
##########################################*/



  /*##############################################################################
##########################################*/

  /*#########################       VETO Detector      ##########################
####*/


  fPhysiPoronLatXRight_3 = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiPoronLatX3_X,fP
hysiPoronLatX3_Y,fPhysiPoronLatX3_Z+ ShiftOrigin),
                                             "VetoPoronXRight_Ext",
                                             fLogicPoronLatX,
                                             motherVolume,
                                             false,
                                             0,true);


  fPhysiPoronLatXLeft_3 = new G4PVPlacement(_rot180Z,
                                            G4ThreeVector(-fPhysiPoronLatX3_X, -
fPhysiPoronLatX3_Y,fPhysiPoronLatX3_Z+ ShiftOrigin),
                                            "VetoPoronXLeft_Ext",
                                            fLogicPoronLatX,
                                            motherVolume,
                                            false,
                                            0,true);


  fPhysiPoronLatYUp_3 = new G4PVPlacement(0,
                                          G4ThreeVector(fPhysiPoronLatY3_X,fPhys
iPoronLatY3_Y,fPhysiPoronLatY3_Z+ ShiftOrigin),
                                          "VetoPoronYUp_Ext",
                                          fLogicPoronLatY,
                                          motherVolume,
                                          false,
                                          0,true);


  fPhysiPoronLatYDown_3 = new G4PVPlacement(_rot180Z,
                                            G4ThreeVector(-fPhysiPoronLatY3_X,-f
PhysiPoronLatY3_Y,fPhysiPoronLatY3_Z+ ShiftOrigin),
                                            "VetoPoronYDown_Ext",
                                            fLogicPoronLatY,
                                            motherVolume,
                                            false,
                                            0,true);
```



```
  ///


  fPhysiPoronLatXRightInt_3 = new G4PVPlacement(0,
                                                G4ThreeVector(fPhysiPoronLatX3In
t_X,fPhysiPoronLatX3Int_Y,fPhysiPoronLatX3_Z+ ShiftOrigin),
                                                "VetoPoronXRight_Int",
                                                fLogicPoronLatX,
                                                motherVolume,
                                                false,
                                                0,true);


  fPhysiPoronLatXLeftInt_3 = new G4PVPlacement(_rot180Z,
                                               G4ThreeVector(-fPhysiPoronLatX3In
t_X,-fPhysiPoronLatX3Int_Y,fPhysiPoronLatX3_Z+ ShiftOrigin),
                                               "VetoPoronXLeft_Int",
                                               fLogicPoronLatX,
                                               motherVolume,
                                               false,
                                               0,true);


  fPhysiPoronLatYUpInt_3 = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiPoronLatY3Int_X
,fPhysiPoronLatY3Int_Y,fPhysiPoronLatY3_Z+ ShiftOrigin),
                                             "VetoPoronYUp_Int",
                                             fLogicPoronLatY,
                                             motherVolume,
                                             false,
                                             0,true);

  fPhysiPoronLatYDownInt_3 = new G4PVPlacement(_rot180Z,
                                               G4ThreeVector(-fPhysiPoronLatY3In
t_X,-fPhysiPoronLatY3Int_Y,fPhysiPoronLatY3_Z+ ShiftOrigin),
                                               "VetoPoronYDown_Int",
                                               fLogicPoronLatY,
                                               motherVolume,
                                               false,
                                               0,true);


  ///


  fPhysiVetoLatXRight_2 = new G4PVPlacement(0,
                                            G4ThreeVector(-fPhysiVetoLatX2_X, fP
hysiVetoLatX2_Y,fPhysiVetoLatX2_Z+ ShiftOrigin),
                                            "VetoXRight",
                                            fLogicVetoLatX,
                                            motherVolume,
                                            false,
                                            0,true);

  fPhysiVetoLatXLeft_2 = new G4PVPlacement(_rot180Z,
                                           G4ThreeVector(fPhysiVetoLatX2_X, -fPh
ysiVetoLatX2_Y, fPhysiVetoLatX2_Z+ ShiftOrigin),
                                           "VetoXLeft",
                                           fLogicVetoLatX2,
                                           motherVolume,
                                           false,
                                           0,true);



  fPhysiVetoLatYUp_2 = new G4PVPlacement(0,
                                         G4ThreeVector(fPhysiVetoLatY2_X, -fPhys
iVetoLatY2_Y,fPhysiVetoLatY2_Z+ ShiftOrigin),
```

```
                                        "VetoYUp",
                                        fLogicVetoLatY,
                                        motherVolume,
                                        false,
                                        0,true);

  fPhysiVetoLatYDown_2 = new G4PVPlacement(_rot180Z,
                                          G4ThreeVector(-fPhysiVetoLatY2_X, fPh
ysiVetoLatY2_Y,fPhysiVetoLatY2_Z+ ShiftOrigin),
                                          "VetoYDown",
                                          fLogicVetoLatY2,
                                          motherVolume,
                                          false,
                                          0,true);


  fPhysiCFVetoLatXRight_2 = new G4PVPlacement(0,
                                           G4ThreeVector(fPhysiCFVetoLatX2_X,
 fPhysiCFVetoLatX2_Y, fPhysiCFVetoLatX2_Z+ ShiftOrigin),
                                           "VetoCFXRight",
                                           fLogicCFVetoLatX,
                                           motherVolume,
                                           false,
                                           0,true);

  fPhysiCFVetoLatXLeft_2 = new G4PVPlacement(_rot180Z,
                                           G4ThreeVector(-fPhysiCFVetoLatX2_X,
 -fPhysiCFVetoLatX2_Y, fPhysiCFVetoLatX2_Z+ ShiftOrigin),
                                           "VetoCFXLeft",
                                           fLogicCFVetoLatX,
                                           motherVolume,
                                           false,
                                           0,true);


  fPhysiCFVetoLatYUp_2 = new G4PVPlacement(0,
                                          G4ThreeVector(fPhysiCFVetoLatY2_X,fPh
ysiCFVetoLatY2_Y,fPhysiCFVetoLatY2_Z+ ShiftOrigin),
                                          "VetoCFYUp",
                                          fLogicCFVetoLatY,
                                          motherVolume,
                                          false,
                                          0,true);

  fPhysiCFVetoLatYDown_2 = new G4PVPlacement(_rot180Z,
                                           G4ThreeVector(-fPhysiCFVetoLatY2_X,
-fPhysiCFVetoLatY2_Y,fPhysiCFVetoLatY2_Z+ ShiftOrigin),
                                           "VetoCFYDown",
                                           fLogicCFVetoLatY,
                                           motherVolume,
                                           false,
                                           0,true);


  ////////////////////////////// Bottom VETO
  fPhysiRealTrapPoronLayer1 = new G4PVPlacement(_rot45,
                                            G4ThreeVector(85.3583951/2.*mm,8
5.3583951/2.*mm,fPhysiRealTrapPoron1_Z+ ShiftOrigin),
                                            "VETOBottPoronLayer1",

                                            fLogicRealTrapPoronLayer,
                                            motherVolume,
                                            false,
                                            0,true);

  fPhysiRealTrapVetoLayer = new G4PVPlacement(_rot45,
                                           G4ThreeVector(85.3583951/2.*mm,85.
3583951/2.*mm,fPhysiRealTrapVeto_Z+ ShiftOrigin),
                                           "VETOBottScintLayer",
```



```
                                           fLogicRealTrapVetoLayer,
                                           motherVolume,
                                           false,
                                           0,true);

  fPhysiRealTrapPoronLayer2 = new G4PVPlacement(_rot45,
                                            G4ThreeVector(85.3583951/2.*mm,8
5.3583951/2.*mm,fPhysiRealTrapPoron2_Z+ ShiftOrigin),
                                            "VETOBottPoronLayer2",

                                            fLogicRealTrapPoronLayer,
                                            motherVolume,
                                            false,
                                            0,true);

  fPhysiRealTrapCFLayer = new G4PVPlacement(_rot45,
                                           G4ThreeVector(85.3583951/2.*mm,85.35
83951/2.*mm,fPhysiRealTrapCF_Z+ ShiftOrigin),
                                           "VETOBottCFLayer",
                                           fLogicRealTrapCFLayer,
                                           motherVolume,
                                           false,
                                           0,true);

  fPhysiRealTrapCFLayer2 = new G4PVPlacement(_rot45,
                                           G4ThreeVector(85.3583951/2.*mm,85.35
83951/2.*mm,fPhysiRealTrapCF2_Z+ ShiftOrigin),
                                           "VETOBottCFLayer2",
                                           fLogicRealTrapCFLayer,
                                           motherVolume,
                                           false,
                                           0,true);


  ////////////////////////////////////////////////////////////////////////////
/////////////////

  ////////////////////////////////////////////


  fPhysiPoronPlateV1_Top = new G4PVPlacement(0,
                                           G4ThreeVector(fPhysiPoronPlateVTop_
X, fPhysiPoronPlateVTop_Y, fPhysiPoronPlateVTop_Z+ ShiftOrigin),
                                           "PoronPlateV_Top",
                                           fLogicPoronPlateV,
                                           motherVolume,
                                           false,
                                           0,true);

  fPhysiPoronPlateO1_Top = new G4PVPlacement(0,
                                           G4ThreeVector(fPhysiPoronPlateOTop_
X, fPhysiPoronPlateOTop_Y, fPhysiPoronPlateOTop_Z+ ShiftOrigin),
                                           "PoronPlateO_Top",
                                           fLogicPoronPlateO,
                                           motherVolume,
                                           false,
                                           0,true);


  fPhysiPoronPlateV2_Top = new G4PVPlacement(0,
                                           G4ThreeVector(-fPhysiPoronPlateVTop
_X, -fPhysiPoronPlateVTop_Y, fPhysiPoronPlateVTop_Z+ ShiftOrigin),
                                           "PoronPlateV_Top",
                                           fLogicPoronPlateV,
                                           motherVolume,
                                           false,
                                           0,true);
```

```
  fPhysiPoronPlateO2_Top = new G4PVPlacement(0,
                                             G4ThreeVector(-fPhysiPoronPlateOTop
_X, -fPhysiPoronPlateOTop_Y, fPhysiPoronPlateOTop_Z+ ShiftOrigin),
                                             "PoronPlateO_Top",
                                             fLogicPoronPlateO,
                                             motherVolume,
                                             false,
                                             0,true);


  fPhysiPoronPlateV1_Bottom = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiPoronPlateVB
ottom_X, fPhysiPoronPlateVBottom_Y, fPhysiPoronPlateVBottom_Z+ ShiftOrigin),
                                             "PoronPlateV_Bottom",
                                             fLogicPoronPlateV,
                                             motherVolume,
                                             false,
                                             0,true);

  fPhysiPoronPlateO1_Bottom = new G4PVPlacement(0,
                                             G4ThreeVector(fPhysiPoronPlateOB
ottom_X, fPhysiPoronPlateOBottom_Y, fPhysiPoronPlateOBottom_Z+ ShiftOrigin),
                                             "PoronPlateO_Bottom",
                                             fLogicPoronPlateO,
                                             motherVolume,
                                             false,
                                             0,true);

  fPhysiPoronPlateV2_Bottom = new G4PVPlacement(0,
                                             G4ThreeVector(-fPhysiPoronPlateV
Bottom_X, -fPhysiPoronPlateVBottom_Y, fPhysiPoronPlateVBottom_Z+ ShiftOrigin),
                                             "PoronPlateV_Bottom",
                                             fLogicPoronPlateV,
                                             motherVolume,
                                             false,
                                             0,true);

  fPhysiPoronPlateO2_Bottom = new G4PVPlacement(0,
                                             G4ThreeVector(-fPhysiPoronPlateO
Bottom_X, -fPhysiPoronPlateOBottom_Y, fPhysiPoronPlateOBottom_Z+ ShiftOrigin),
                                             "PoronPlateO_Bottom",
                                             fLogicPoronPlateO,
                                             motherVolume,
                                             false,
                                             0,true);



  /*


  fPhysiHoneyCombSkinLatYPInt = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinLatYInt_X,fPhysiHoneyCombSkinLatYInt_Y,fPhysi
HoneyCombSkinLatYInt_Z),
  "HoneyCombSkinLYPI",
  fLogicHoneyCombSkinLatY,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombLatYP = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombLatY_X,fPhysiHoneyCombLatY_Y,fPhysiHoneyCombLatY_
Z),
  "HoneyCombCoreLYP",
  fLogicHoneyCombLatY,
  motherVolume,
  false,
  0,true);
```



```
  fPhysiHoneyCombSkinLatYPExt = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinLatYExt_X,fPhysiHoneyCombSkinLatYExt_Y,fPhysi
HoneyCombSkinLatYExt_Z),
  "HoneyCombSkinLYPE",
  fLogicHoneyCombSkinLatY,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombSkinLatYMInt = new G4PVPlacement(0,
  G4ThreeVector(-fPhysiHoneyCombSkinLatYInt_X,fPhysiHoneyCombSkinLatYInt_Y,fPhys
iHoneyCombSkinLatYInt_Z),
  "HoneyCombSkinLYMI",
  fLogicHoneyCombSkinLatY,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombLatYM = new G4PVPlacement(0,
  G4ThreeVector(-fPhysiHoneyCombLatY_X,fPhysiHoneyCombLatY_Y,fPhysiHoneyCombLatY
_Z),
  "HoneyCombCoreLYM",
  fLogicHoneyCombLatY,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombSkinLatYMExt = new G4PVPlacement(0,
  G4ThreeVector(-fPhysiHoneyCombSkinLatYExt_X,fPhysiHoneyCombSkinLatYExt_Y,fPhys
iHoneyCombSkinLatYExt_Z),
  "HoneyCombSkinLYME",
  fLogicHoneyCombSkinLatY,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombSkinLatXPInt = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinLatXInt_X,fPhysiHoneyCombSkinLatXInt_Y,fPhysi
HoneyCombSkinLatXInt_Z),
  "HoneyCombSkinLXPI",
  fLogicHoneyCombSkinLatX,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombLatXP = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombLatX_X,fPhysiHoneyCombLatX_Y,fPhysiHoneyCombLatX_
Z),
  "HoneyCombCoreLXP",
  fLogicHoneyCombLatX,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombSkinLatXPExt = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinLatXExt_X,fPhysiHoneyCombSkinLatXExt_Y,fPhysi
HoneyCombSkinLatXExt_Z),
  "HoneyCombSkinLXPE",
  fLogicHoneyCombSkinLatX,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombSkinLatXMInt = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinLatXInt_X,-fPhysiHoneyCombSkinLatXInt_Y,fPhys
iHoneyCombSkinLatXInt_Z),
  "HoneyCombSkinLXMI",
  fLogicHoneyCombSkinLatX,
  motherVolume,
```

```
  false,
  0,true);

  fPhysiHoneyCombLatXM = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombLatX_X,-fPhysiHoneyCombLatX_Y,fPhysifLogicCrystal
ActiveBlock->SetVisAttributes(attGreen);HoneyCombLatX_Z),
  "HoneyCombCoreLXM",
  fLogicHoneyCombLatX,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombSkinLatXMExt = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinLatXExt_X,-fPhysiHoneyCombSkinLatXExt_Y,fPhys
iHoneyCombSkinLatXExt_Z),
  "HoneyCombSkinLXME",
  fLogicHoneyCombSkinLatX,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombSkinBottomU = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinBottomU_X,fPhysiHoneyCombSkinBottomU_Y,fPhysi
HoneyCombSkinBottomU_Z),
  "HoneyCombSkinBU",
  fLogicHoneyCombSkinBottom,
  motherVolume,
  false,
  0,true);

  fPhysiHoneyCombBottom = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombBottom_X,fPhysiHoneyCombBottom_Y,fPhysiHoneyCombB
ottom_Z),
  "HoneyCombCoreB",
  fLogicHoneyCombBottom,
  motherVolume,
  false,
  0,true);
  fLogicCrystalActiveBlock->SetVisAttributes(attGreen);
  fPhysiHoneyCombSkinBottomD = new G4PVPlacement(0,
  G4ThreeVector(fPhysiHoneyCombSkinBottomD_X,fPhysiHoneyCombSkinBottomD_Y,fPhysi
HoneyCombSkinBottomD_Z),
  "HoneyCombSkinBD",
  fLogicHoneyCombSkinBottom,
  motherVolume,
  false,
  0,true);
  */


  fPhysiCFSuppTop = new G4PVPlacement(0,      // prima croce all'inizio del calo
rimetro
                                      G4ThreeVector(fPhysiCFSuppTop_X,fPhysiCFSu
ppTop_Y,fPhysiCFSuppTop_Z+ ShiftOrigin),
                                      "CFSupportTop",
                                      fLogicCFSuppTop,
                                      motherVolume,
                                      false,
                                      0,true);


  fPhysiCFSuppTop = new G4PVPlacement(0,      // prima croce poron all'inizio de
l calorimetro
                                      G4ThreeVector(fPhysiPORSuppTop_X, fPhysiPO
RSuppTop_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                      "PORSupportTop",
                                      fLogicCFSuppPoron,
                                      motherVolume,
                                      false,
```



```
                                      0,true);

  // blocco carbonio sopra croce poron
  fPhysiScintCFFrontPPO = new G4PVPlacement(0,
                                      G4ThreeVector(fPhysiCFFrontPO_X, fPh
ysiCFFrontPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                      "CFSupportFPsmall",
                                      fLogicCFFrontPO,
                                      motherVolume,
                                      false,
                                      0,true);
  // blocco carbonio sotto croce  poron
  fPhysiScintCFFrontMPO = new G4PVPlacement(0,
                                      G4ThreeVector(fPhysiCFFrontPO_X,-fPh
ysiCFFrontPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                      "CFSupportFMsmall",
                                      fLogicCFFrontPO,
                                      motherVolume,
                                      false,
                                      0,true);
  // blocco carbonio destra croce poron
  fPhysiScintCFLatPPO = new G4PVPlacement(0,
                                      G4ThreeVector(fPhysiCFLatPO_X,fPhysiCF
LatPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                      "CFSupportLPsmall",
                                      fLogicCFLatPO,
                                      motherVolume,
                                      false,
                                      0,true);
  // blocco carbonio sinistra croce poron
  fPhysiScintCFLatMPO = new G4PVPlacement(0,
                                      G4ThreeVector(-fPhysiCFLatPO_X,fPhysiC
FLatPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                      "CFSupportLMsmall",
                                      fLogicCFLatPO,
                                      motherVolume,
                                      false,
                                      0,true);

  // poron parete laterale sinistra croce poron
  fPhysiScintPoronLatPPO = new G4PVPlacement(0,
                                       G4ThreeVector(fPhysiPoronLatPO_X,fP
hysiPoronLatPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                       "PoronLPsmall",
                                       fLogicPoronLatPO,
                                       motherVolume,
                                       false,
                                       0,true);


  // poron parete laterla destra croce poron
  fPhysiScintPoronLatMPO = new G4PVPlacement(0,
                                       G4ThreeVector(-fPhysiPoronLatPO_X,f
PhysiPoronLatPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                       "PoronLMsmall",
                                       fLogicPoronLatPO,
                                       motherVolume,
                                       false,
                                       0,true);
  // poron parete sopra croce poron
  fPhysiScintPoronLatUpPO = new G4PVPlacement(0,
                                        G4ThreeVector(fPhysiPoronFrontPO_X
,-fPhysiPoronFrontPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                        "PoronFPsmall",
                                        fLogicPoronFrontPO,
                                        motherVolume,
                                        false,
                                        0,true);
  // poron parete sotto croce poron
  fPhysiScintPoronLatDownPO = new G4PVPlacement(0,
```

```
                                                G4ThreeVector(fPhysiPoronFrontPO
_X,fPhysiPoronFrontPO_Y, fPhysiPORSuppTop_Z+ ShiftOrigin),
                                                "PoronFMsmall",
                                                fLogicPoronFrontPO,
                                                motherVolume,
                                                false,
                                                0,true);

  //  ////////////////////////////////////////////////////////////////////////
////////



  //Visualization Attribute
  G4VisAttributes* attCyan = new G4VisAttributes(G4Colour::Cyan());
  attCyan->SetVisibility(true);
  attCyan->SetForceAuxEdgeVisible(true);


  G4VisAttributes* attMagenta = new G4VisAttributes(G4Colour::Magenta());
  attMagenta->SetVisibility(true);
  attMagenta->SetForceAuxEdgeVisible(true);
  fLogicS1Scint->SetVisAttributes(attMagenta);
  fLogicScintActiveLayer->SetVisAttributes(attMagenta);


  G4VisAttributes* attYellow = new G4VisAttributes(G4Colour::Yellow());
  attYellow->SetVisibility(true);
  attYellow->SetForceAuxEdgeVisible(true);
  fLogicS1SuppPoronFront->SetVisAttributes(attYellow);
  fLogicPoronLat->SetVisAttributes(attYellow);
  fLogicPoronFront->SetVisAttributes(attYellow);
  fLogicPoronLatPO->SetVisAttributes(attYellow);
  fLogicPoronFrontPO->SetVisAttributes(attYellow);
  fLogicPoronLatX->SetVisAttributes(attYellow);
  fLogicPoronLatY->SetVisAttributes(attYellow);
  fLogicCFSuppPoron->SetVisAttributes(attYellow);
  fLogicRealTrapPoronLayer->SetVisAttributes(attYellow);
  fLogicPoronPlateO->SetVisAttributes(attYellow);
  fLogicPoronPlateV->SetVisAttributes(attYellow);
  fLogicExternalPoronSupport->SetVisAttributes(attYellow);


  G4VisAttributes* attBrown = new G4VisAttributes(G4Colour::Brown());
  attBrown->SetVisibility(true);
  attBrown->SetForceAuxEdgeVisible(true);
  fLogicS1SuppBack->SetVisAttributes(attBrown);
  fLogicS1SuppFront->SetVisAttributes(attBrown);
  fLogicS1SuppHoleBar->SetVisAttributes(attBrown);
  fLogicS1SuppBar->SetVisAttributes(attBrown);
  fLogicS1SuppThinBar->SetVisAttributes(attBrown);
  fLogicS1SuppThinBarBack->SetVisAttributes(attBrown);
  fLogicCFLat->SetVisAttributes(attBrown);
  fLogicCFFront->SetVisAttributes(attBrown);
  fLogicCFLatPO->SetVisAttributes(attBrown);
  fLogicCFFrontPO->SetVisAttributes(attBrown);
  fLogicCFSupp->SetVisAttributes(attBrown);
  fLogicCFSuppTop->SetVisAttributes(attBrown);
  fLogicCFCrystalPanelDown->SetVisAttributes(attBrown);
  fLogicCFBlockContainer->SetVisAttributes(attBrown);
  fLogicCFCrystalSideX->SetVisAttributes(attBrown);
  fLogicCFCrystalSideYBig->SetVisAttributes(attBrown);
  fLogicRealTrapCFLayer->SetVisAttributes(attBrown);
  fLogicCFCrystalPanelDown2->SetVisAttributes(attBrown);

  fLogicCFVetoLatX->SetVisAttributes(attBrown);
  fLogicCFVetoLatY->SetVisAttributes(attBrown);
```



```
  G4VisAttributes* attGreen = new G4VisAttributes(G4Colour::Green());
  attGreen->SetVisibility(true);
  attGreen->SetForceAuxEdgeVisible(true);
  fLogicTeflonContainer->SetVisAttributes(attGreen);


  G4VisAttributes* attRed = new G4VisAttributes(G4Colour::Red());
  attRed->SetVisibility(true);
  attRed->SetForceAuxEdgeVisible(true);



  G4VisAttributes* attBlue = new G4VisAttributes(G4Colour::Blue());
  attBlue->SetVisibility(true);
  attBlue->SetForceAuxEdgeVisible(true);
  fLogicCrystalActiveBlock->SetVisAttributes(attBlue);
  fLogicVetoLatX->SetVisAttributes(attBlue);
  fLogicVetoLatX2->SetVisAttributes(attBlue);
  fLogicVetoLatY->SetVisAttributes(attBlue);
  fLogicVetoLatY2->SetVisAttributes(attBlue);
  fLogicRealTrapVetoLayer->SetVisAttributes(attBlue);



  G4VisAttributes * attInvisible = new G4VisAttributes();
  attInvisible->SetVisibility(false);
  attInvisible->SetForceAuxEdgeVisible(false);
  fLogicS1->SetVisAttributes(attInvisible);
  fLogicS1ScintContainerP->SetVisAttributes(attInvisible);
  fLogicS1ScintContainerM->SetVisAttributes(attInvisible);
  fLogicCaloBox->SetVisAttributes(attInvisible);
  fLogicScintBox->SetVisAttributes(attInvisible);
  fLogicScintLayer->SetVisAttributes(attInvisible);
  fLogicLastScintLayer->SetVisAttributes(attInvisible);
  fLogicCrystalBlockPlaneContainer->SetVisAttributes(attInvisible);
  fLogicCrystalBlockRawContainer->SetVisAttributes(attInvisible);
  fLogicCrystalBlockContainer->SetVisAttributes(attInvisible);
  fLogicCrystalBox->SetVisAttributes(attInvisible);

}
```