
Subject: Pion off Nuclei [quasi-free]

Posted by [Ingo Fröhlich](#) on Mon, 16 Apr 2012 14:39:53 GMT

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Just a macro which adds the quasi-free ($\pi^- + p$) reaction to Pluto:

```
{  
  
  //Add our quasi-free composite:  
  makeStaticData()->AddParticle(14009, "pi- + p",0.938272+0.139570);  
  //Creates just a symbolic link:  
  makeStaticData()->AddAlias("pi- + p","pi-+p");  
  
  //Executes the fermi plugin which adds also nuclei:  
  makeDistributionManager()->Exec("nucleus_fermi");  
  
  //Add a new composite particle (target_id*1000 * beam_id)  
  //N.B. that "nucleus_fermi" has already added the 12C (with id=614)  
  makeStaticData()->AddParticle(614009,"pi- + 12C",11.174862+0.139570);  
  //Creates again a symbolic link:  
  makeStaticData()->AddAlias("pi- + 12C","pi-+12C");  
  
  //adds a decay by using the "pi- + 12C" particle as created above:  
  makeStaticData()->AddDecay(-1, "pi- + 12C -> (pi- + p) + 11B (quasi-free)","pi- + 12C","pi- +  
p,11B", 1.0);  
  
  //This is the fermi model (contributed by M. Dieterle and L. Witthauer, Basel):  
  PFermiMomentumGA * pmodel = new PFermiMomentumGA("pi-p_in_12C@pi- +  
12C_to_pi- + p_11B", "Quasi-free particle production <nucleus_fermi>",-1);  
  pmodel->Add("q,parent");  
  pmodel->Add("pi-,grandparent,beam");  
  pmodel->Add("12C,grandparent,target");  
  pmodel->Add("11B,daughter,spectator");  
  pmodel->Add("q,daughter,composite");  
  pmodel->Add("p,granddaughter,participant");  
  pmodel->Add("pi-,granddaughter,p2");  
  makeDistributionManager()->Add(pmodel);  
  
  //This is our reaction, in this case just a quasi-free elastic reaction:  
  PReaction *Reac = new PReaction ("_P1=3.5","pi-","12C","(pi- p) pi- p (11B)","filename");  
  
  TH2F * histo2 = new TH2F ("histo2","Rap. vs. Pt",50,-1.5,3.5, 50,0,1.5);  
  Reac->Do(histo2,"foreach(pi-); _x = [pi-]->Rapidity(); _y=[pi-]->Pt(); ");  
  
  Reac->Print();  
  Reac->loop(1000); // Number of events  
  
  histo2->Draw("colz");  
  
}
```

The nucleus_fermi plugin supports already gamma and proton beams - I think in the future I

will add the pion beam as well, but at the moment the macro above should do the job (it needs some adaptations of course to other cases like $\pi^+ + n$)

For completeness, this is the result:

File Attachments

1) [c1.png](#), downloaded 1528 times

