



$$D_S^{*+} \rightarrow D_S^+ e^+ e^-$$

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## Contents

- Digging into pi0s and etas making up Ds tags

run\_origin = 230474, run\_reProc = 230474  
i = 82 event\_origin = 1912, i+k = 82 event\_reProc = 1912  
Original Ds mass = 1.9587, Reprocessed Ds mass = 1.89973  
Decay mode = 422, Decay mode = 422  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
Origin pi0RawMass = 0.140952, pi0Pull Mass = 1.55643  
reProc pi0RawMass = 0.140952, pi0Pull Mass = 1.55643

run\_origin = 230474, run\_reProc = 230474  
i = 83 event\_origin = 1912, i+k = 83 event\_reProc = 1912  
Original Ds mass = 2.0165, Reprocessed Ds mass = 1.90353  
Decay mode = 422, Decay mode = 422  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
Origin pi0RawMass = 0.140952, pi0Pull Mass = 1.55643  
reProc pi0RawMass = 0.140952, pi0Pull Mass = 1.55643

run\_origin = 230474, run\_reProc = 230474  
i = 84 event\_origin = 1912, i+k = 84 event\_reProc = 1912  
Original Ds mass = 1.91175, Reprocessed Ds mass = 1.9587  
Decay mode = 441, Decay mode = 422  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc pi0RawMass = 0.140952, pi0Pull Mass = 1.55643

run\_origin = 230474, run\_reProc = 230474  
i = 85 event\_origin = 1912, i+k = 85 event\_reProc = 1912  
Original Ds mass = 1.95877, Reprocessed Ds mass = 2.0165  
Decay mode = 442, Decay mode = 422  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc pi0RawMass = 0.140952, pi0Pull Mass = 1.55643  
Origin etaRawMass = 0.553374, etaPull Mass = 0.576431

run\_origin = 230474, run\_reProc = 230474  
i = 86 event\_origin = 1912, i+k = 86 event\_reProc = 1912  
Original Ds mass = 2.02816, Reprocessed Ds mass = 1.91175  
Decay mode = 442, Decay mode = 441  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
Origin etaRawMass = 0.553374, etaPull Mass = 0.576431

run\_origin = 230474, run\_reProc = 230474  
i = 87 event\_origin = 1912, i+k = 87 event\_reProc = 1912  
Original Ds mass = 2.01658, Reprocessed Ds mass = 1.90256  
Decay mode = 501, Decay mode = 442  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
Origin pi0RawMass = 0.140952, pi0Pull Mass = 1.55643  
reProc etaRawMass = 0.553374, etaPull Mass = 0.576431

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 88 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 1.95877  
Decay mode = 440, Decay mode = 442  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc etaRawMass = 0.553374, etaPull Mass = 0.576431  
New DTag!

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 89 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 2.02812  
Decay mode = 440, Decay mode = 442  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc etaRawMass = 0.553374, etaPull Mass = 0.576431  
New DTag!

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 90 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 1.9175  
Decay mode = 440, Decay mode = 442  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc etaRawMass = 0.573053, etaPull Mass = 2.46043  
New DTag!

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 91 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 2.02816  
Decay mode = 440, Decay mode = 442  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc etaRawMass = 0.553374, etaPull Mass = 0.576431  
New DTag!

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 92 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 2.01389  
Decay mode = 440, Decay mode = 481  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
New DTag!

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 93 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 1.98934  
Decay mode = 440, Decay mode = 481  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
New DTag!

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 94 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 1.89979  
Decay mode = 440, Decay mode = 501  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc pi0RawMass = 0.140952, pi0Pull Mass = 1.55643  
New DTag!

run\_origin = 230474, run\_reProc = 230474  
i = 88 event\_origin = 1915, i+k = 95 event\_reProc = 1912  
Original Ds mass = 2.01692, Reprocessed Ds mass = 2.01658  
Decay mode = 440, Decay mode = 501  
beamEnergy\_origin = 2.08277, beamEnergy\_reProc = 2.08278  
reProc pi0RawMass = 0.140952, pi0Pull Mass = 1.55643  
New DTag!

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// Fill in pi0, eta information for further digging
if (dsPlus.decayMode()==422 || dsPlus.decayMode()==501)
{
  int numberChildren=dsPlus.numberChildren();
  int ipi0s=0;
  for (int i=0; i<numberChildren; ++i)
  {
    const CDCandidate &child=dsPlus.child(i);
    if (child.builtFromCDPi0())
    {
      ++ipi0s;
      const NavPi0ToGG& pi0=child.navPi0();
      tuple[9]=pi0.pi0().unconMass();
      tuple[10]=pi0.pi0().pullMass();
    }
  }
  if (ipi0s>1) std::cout<<ipi0s<<" pi0s found in this 422 decay event!"<<std::endl;
}
if (dsPlus.decayMode()==442)
{
  int numberChildren=dsPlus.numberChildren();
  int ietas=0;
  for (int i=0; i<numberChildren; ++i)
  {
    const CDCandidate &child=dsPlus.child(i);
    if (child.builtFromCDEta())
    {
      ++ietas;
      const NavEtaToGG& eta=child.navEta();
      tuple[11]=eta.eta().unconMass();
      tuple[12]=eta.eta().pullMass();
    }
  }
  if (ietas>1) std::cout<<ietas<<" etas found in this 422 decay event!"<<std::endl;
}
m_dNtuple4->fill(tuple);

```