

Receipt for DC2

(Julie McEnergy)

```
TCut DC2Trigger="(GltWord&26)>0&&GltWord!=35";
TCut DC2Filter="FilterStatus_HI==0";
TCut DC2PrefilterCal="CalEnergyRaw>5&&CalCsIRLn>4";
TCut DC2AcdVeto="(AcdCornerDoca>-5&&AcdCornerDoca<50&&CTBTkrLATEdge<100)||
                ((AcdActiveDist3D>0 || AcdRibbonActDist>0)&&Tkr1SSDVeto<2)";
TCut Basic="CTBCORE>0.1&&CTBBestEnergyProb>0.1&&CTBGAM>0.";
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//-----
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// Use one of the following to select an event class.
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TCut DC2Base1="CTBCORE>0.1&&CTBBestEnergyProb>0.1&&CTBGAM>0.35";
TCut DC2Base2="CTBCORE>0.1&&CTBBestEnergyProb>0.1&&CTBGAM>0.55";
TCut DC2Base3="CTBCORE>0.35&&CTBBestEnergyProb>0.35&&CTBGAM>0.50";
```

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// Final Event Classes
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TCut GoodEvent1=DC2Trigger&&DC2Filter&&DC2PrefilterCal&&!DC2AcdVeto&&DC2Base1;
TCut GoodEvent2=DC2Trigger&&DC2Filter&&DC2PrefilterCal&&!DC2AcdVeto&&DC2Base2;
TCut GoodEvent3=DC2Trigger&&DC2Filter&&DC2PrefilterCal&&!DC2AcdVeto&&DC2Base3;
```

Almost complete – a few more cuts however...

Description:

TCut DC2Trigger="(GltWord&26)>0&&GltWord!=35";

Actually I didn't do this but should... Its our Hardware Trigger Bias

TCut DC2Filter="FilterStatus_HI==0";

On Board Filter Engaged

TCut DC2PrefilterCal="CalEnergyRaw>5&&CalCsIRLn>4";

Not a No-Cal Event – Its seems the min CalEnergyRaw = 10 MeV ??

TCut DC2AcdVeto=

"(AcdCornerDoca>-5&&AcdCornerDoca<50&&CTBTkrLATEdge<100) ||

This is the corner leakage phase-space

((AcdActiveDist3D>0 || AcdRibbonActDist>0)&&Tkr1SSDVeto<2)";

This is the min. I can imagine. All prefilter bkg. rej. cuts will be stronger – **Needs to be checked!**

TCut Basic="CTBCORE>0.1&&CTBBestEnergyProb>0.1&&CTBGAM>0.";

Minimal PSF & Energy Recon. - Bkg. PreFilters Engaged

Event Classes:

TCut DC2Base1="CTBCORE>0.1&&CTBBestEnergyProb>0.1&&CTBGAM>0.35";

Natural break in background rejection

TCut DC2Base2="CTBCORE>0.1&&CTBBestEnergyProb>0.1&&CTBGAM>0.55";

Give us .036 Hz Bkg Rate (~ SDR Level)

TCut DC2Base3="CTBCORE>0.35&&CTBBestEnergyProb>0.35&&CTBGAM>0.50";

Increases Resolutions – to replace bkg. rejection

Limit Phase Space

CTBBestZDir < -.3 && CTBBestEnergy > 100

Limit FoV and Energy Range for Bkg. Rates

Holes in the Dike

Hi Energy Electrons:

$((\min(\text{abs}(\text{Tkr1XDir}), \text{abs}(\text{Tkr1YDir})) < .01 \ \&\& \ \text{Tkr1DieEdge} < 10 \ \& \ \text{AcdActiveDist3D} > 0 \ \&\& \ \text{AcdActDistTileEnergy} > .2) \ ||$

Gaps in between SSD's...

$(\text{Tkr1SSDVeto} < 2 \ \& \ \text{AcdActiveDist3D} > -3 \ \&\& \ \text{AcdActDistTileEnergy} > .3) \ ||$

Extend the active area by 3mm – not surprising

$(\ \text{AcdActiveDist3D} > (-30 + 30 * (\text{Tkr1FirstLayer} - 2))) \ \&\& \ \text{CTBBestEnergy} > 5000$

Garbage in the last layers - as usual

Multi-Track – Low Energy Events

$(\text{Tkr1FirstLayer} - \text{Tkr2FirstLayer}) < 0 \ \& \ \text{Tkr2FirstLayer} > 4 \ \& \ \text{Tkr2TkrHDoca} > 100$

Multi-track events where Tkr2 starts above Tkr1 and the starts are separated by > 100 mm.

CTB Variable Definitions

CTBAcdLowerTileCount	AcdNoSideRow3
CTBAcdUpperTileCount	AcdNoTop+AcdNoSideRow0+AcdNoSideRow1+AcdSideRow2
CTBBestPSFerr	$\text{Acos}(\text{BestDir} * \text{McDir})$
CTBBestXDir, YDir, ZDir	Best direction selected between VTX and Tkr1 Solutions
CTBBestDeltaEoE	Best Energy Error relative to MC energy $D(E)/E$
CTBBestEnergy	Best Estimated energy from among the 4 methods
CTBBestEnergyProb	Energy Prob. Knob. Energy RESOLUTION: Prob. for the selected energy correction method
CTBBestLogEnergy	$\text{Log}(\text{CTBBestEnergy}) - \text{base } 10$
CTBCORE	Image Prob. Knob. IMAGE RESOLUTION
CTBCalDocaAngle	$\text{CalTrackDoca} + 80 * \text{CalTrackAngle}$
CTBCalMaxXtalRatio	$\text{CalXtalMaxEne} / \text{CalEnergyRaw}$
CTBCalTransTCCD	$\text{CalTransRms} + .1 * (\text{CalTrackDoca} - 2.5 * \text{Tkr1CoreHC})$
CTBGAM	Bkg. Rejection Prob Knob: BACK GROUND CONTAMINATION
CTBLastLayerProb, ParamProb, ProfileProb, TrackerProb	Prob. for the "corrections" of each energy method against a fixed functional standard.

More... CTB Variable Definitions

CTBTkrCoreCalDoca	CalTrackDoca - 2.5*Tkr1CoreHC – Bkg. Rej. Variable
CTBTkrEnergyFrac	TkrEnergyCorr/EvtEnergyCorr – Bkg. Rej. Variable
CTBTkrLATEdge	742. - max(abs(Tkr1X0) , abs(Tkr1Y0)) – Fiducial Volume Var.
CTBTkrSHRCalAngle	CalTrackAngle - .2*TkrSurplusHitRatio – Bkg. Rej. Var.
CTBVTX	Internal Prob use to select between 1TKr solution and VTX