

Re: Confusion about IsolationCloseByCorrection CPTool

Johannes Josef Junggeburth

Sent: 29 September 2018 02:29**To:** Sourav Sen; Matthew Henry Klein**Cc:** Otilia Anamaria Ducu

Hi Sourav,

Am 29.09.2018 um 04:32 schrieb Sourav Sen:

Dear Matt and Johannes,

Thanks a lot for the detailed information and clarification of the confusion. It is extremely helpful.

I was initially using getCloseByCorrection <https://gitlab.cern.ch/atlas/athena/blob/48a4143b865ebaf5490cd7be74b54a957cdd7d05/PhysicsAnalysis/AnalysisCommon/IsolationSelection/Root/IsolationCloseByCorrectionTool.cxx#L226> instead of getCloseByIsoCorrection <https://gitlab.cern.ch/atlas/athena/blob/48a4143b865ebaf5490cd7be74b54a957cdd7d05/PhysicsAnalysis/AnalysisCommon/IsolationSelection/Root/IsolationCloseByCorrectionTool.cxx#L226>, so was doing the corrections for muons and electrons separately. I would try to use the getCloseByIsoCorrection with both electron and muon containers as inputs and e-mu overlaps would then be taken care of automatically.

I was just wondering that does the correction depend upon the choice of isolation WP (m_IsoTool in SUSY-4L framework)? With getCloseByCorrection, I checked that the isolation corrections did not depend on which isolation working point I initialized the closebycorrection tool with.

In principle, the correction depends on the isolation WP. If the lepton already satisfies the isolation, then the correction is skipped for computing time-reasons.

Also, if I use containers which already have good leptons with OR, do I need to initialize the closebycorrection tool with the first two flags as here: `ATH_CHECK(m_IsoCorrect.setProperty("SelectionDecorator", "signal"));`
`ATH_CHECK(m_IsoCorrect.setProperty("PassoverlapDecorator", "passLMR"));`
or can I skip setting these two properties in the closebycorrection tool altogether?

The tool needs to know which leptons are good leptons. You've the possibility to set two decorations, since the information usually comes from two different places. Historically:

`susyTools->GetElectrons()``susyTools->GetMuons()``susytools->PerformOR()`

--- I was too lazy to loop over the container again just to set a third decoration.

Best,
Johannes

Thanks again!

With best regards,
Sourav

From: Johannes Josef Junggeburth
Sent: 28 September 2018 05:32
To: Matthew Henry Klein; Sourav Sen
Cc: Otilia Anamaria Ducu
Subject: Re: Confusion about IsolationCloseByCorrection CPTool

Hi Sourav,

please have a look at the initialization of the tool in the SUSY-4L analysis here:

<https://gitlab.cern.ch/atlas-mpp-xampp/XAMPPmultilep/blob/master/XAMPPmultilep/Root/SUSY4LeptonAnalysisHelper.cxx#L98>

You define two flags - of type `char` - which tell the tool only to select good quality leptons which pass the OR. If you drop the OR it's also okay.

You can backup the isolation cones used by the tool. It automatically creates a decorator called `<MyBackupPreFix>_<isolation variable>`

You can parse the final decision of the tool into an own decorator

The last line is just to avoid to setup multiple instances of the `TrackSelectionTool`

Then simply parse your lepton containers to the tool, like it's done here: <https://gitlab.cern.ch/atlas-mpp-xampp/XAMPPmultilep/blob/master/XAMPPmultilep/Root/SUSY4LeptonAnalysisHelper.cxx#L115>

Best,

Johannes

On 09/28/2018 11:04 AM, Matthew Klein wrote:

Sorry, forgot to actually add Johannes the first time...

On Fri, Sep 28, 2018 at 11:04 AM, Matthew Klein <matthew.h.klein@gmail.com> wrote:

Hi,

I'm cc'ing Johannes, who is the expert on the closeby tool and is probably best able to answer the question. But yes, in general the vector you pass should contain both electrons and muons, since you want to correct the isolation in the closeby e-mu case as well.

Cheers, Matt

On Fri, Sep 28, 2018 at 1:16 AM, Sourav Sen <sourav.sen@cern.ch> wrote:

Dear Experts,

I am trying to implement the isolation closeby correction CP tool (<https://twiki.cern.ch/twiki/bin/viewauth/AtlasProtected/IsolationOverlapRemoval>) in out HWWPxAODMaker (<https://gitlab.cern.ch/atlas-physics/higgs/hww/HWWPhysicsxAODMaker/tree/implementation-of-isolationclosebycorrectiontool>).

My confusion is: does the vector of close-by particles contributing to the correction has to be of the same type as the particle being corrected, i.e, if a final state containing both electrons and muons, for correction of a muon should I pass a vector of just all the other muons or include the electrons as well?

I would really appreciate if you could clarify this confusion about this isolation tool.

Thanks a lot!

With best regards,
Sourav

