EBL/ALP/IGMF/LIV call – 2016-10-03

Indico:

https://www.cta-observatory.org/indico/conferenceDisplay.py?confId=1213

Participants (in random order):

David Sanchez, Tomislav Terzic, Jonathan Biteau, Fabrizio Tavecchio, Tarek Hassan, Paolo Goldoni, Oscar Blanch Bigas, Abelardo Moralejo Olaizola, Miguel Sanchez-Conde, Jean-Philippe Lenain, Helene Sol, John E Ward, Vitor de Souza, Manuel Meyer, Leyre Nogues, Malcolm Fairbairn, Alberto Dominguez, Ievgen Vovk, Garret Cotter, Santiago Pita

Introduction

. see slides at https://www.cta-observatory.org/indico/getFile.py/access?contribId=0&resId=0&materialId=slides&confId=1213
. Abelardo asks about level of detail we should get into.
Jonathan: Goal today is to trigger discussions.

EBL and intrinsic spectra

. see slides at https://www.cta-observatory.org/indico/materialDisplay.py?contribId=1&materialId=slides&confId=1213
. Abelardo: how much does it matter how we treat the EBL fitting splines vs gaussian given the width of the gamma-gamma cross section?
Jonathan answers: study is for a broad wavelength in EBL, so might be important. Could be studied with simulations.
. Abelardo: follow up question: how is redshift evolution is taken into account? Is it possible for large redshift to use e.g. splines?
Jonathan answers: that should be left for discussion, we should discuss that in the EBL task force. One could imagine to parametrize models à la Dominguez or à la Franceschini, in which case evolution up ot large redshifts would not be an issue.

ALPs & IGMF

. see slides at https://www.cta-observatory.org/indico/getFile.py/access?contribId=2&resId=0&materialId=slides&confId=1213
. Jonathan asks about possible progress with CTA study
Manuel: more sources will help, only handful of most promising sources was considered so far. Input from source number estimation will help. For ALPs he prefers search for irregularities since a) we might be able to probe ALP DM parameter space, b) space for reduced opacity becomes more and more constrained, but we should discuss this further. For IGMF: spatial information could improve constraints especially for larger field strenghts.
. Ievgen Vovk makes remark that B field filling factor should be taken into account and probed with CTA, something similar could be done for efficiency of plasma instabilities (Manuel). Also possible: look at AGN close to clusters and far away, with this one could probe filling factor if we actually saw the cascade contribution
. To our knowledge there is no publicly available code for plasma instabilities.
. Vitor is in favour of using (and waiting for) 3D monte carlo code.

LIV

. see slides at https://www.cta-observatory.org/indico/materialDisplay.py?contribId=3&materialId=slides&confId=1213
. Malcolm's comment: Thanks for the nice talk Fabrizio, We were just TRYING to follow the philosophy set out in Protheroe and Meyer - http://inspirehep.net/record/527519?ln=en (different Meyer). If this difference in the approach became an issue, we could think about it a bit more. To be honest we didn't think about this in great great depth.
. Question by Manuel: How can we improve current bounds (Fermi GRB) best with CTA.
Fabrizio: best possibility is to search for effects kicking in at TeV energies, n = 2, n = 3 terms.
. Vitor: mentions ongoing work on SimProp to also include LIV effects

Simulations

. Tarek: IRFs for North and South ready, update on publicly available IRFs should come shortly / mid term. One should use those that are public. Threshold implementations are still being discussed, especially for South. Needs to be discussed on a political level.
. Tarek: IRFs for energy or angular resolution : could be produced in short / medium timescale. Changing IRFs does not change the analysis.
. Abelardo: threshold implementation have not changed so far, southern side has no LSTs at the moment, but partners could invest to change that. Threshold implementations should be available when made public
. Follow up by Jonathan: what is meant by short / mid term:
Tarek & Abelardo: less than 6 months, performance curves will be shown in Bologna for prod3b, but formats need to be fixed. Internal: should be there for Bologna meeting. Public curves: will take months. One could start with internal root formats but Tarek recommends to start with ctools in the IRFs that are available now.
. Could be started right away especially for intrinsic spectrum task

Analysis Tools

. see slides at https://www.cta-observatory.org/indico/materialDisplay.py?contribId=5&materialId=slides&confId=1213
. Question by Jonathan: could we use code to simulate spectra with ctools? Or are developments needed?
David: should be possible in short amount of time
. gammaPy and ctools should both be used
. Vitor: we should use two independent lines of analyses. Is this already clear?
David: there will be science tools that will be uniquely used, so it will be hard to have a cross check.
. Jonathan: what's the difference between gammaPy and ctools? Using both of them, would that be a cross check?
David: philosophies are very different, ctools is stand alone, gammaPy is the opposite. Why both: not decided which one will go into the final science tools.

To-do list & Discussion

. check out the list of tasks and sign up: https://portal.cta-observatory.org/WG/PHYS/SitePages/Consortium%20Publication%20EBL,%20ALP,%20LIV,%20IGMF.aspx
. Ievgen: have leaders been identified for the sub-tasks? Manuel & Jonathan: not yet, they will hopefully naturally emerge from the discussions within the sub-emailing lists, based on the work that is being done.
. Important to have progress until next meeting in terms of e.g. intrinsic spectra or source selections.