LArSoft - Necessary Maintenance #18478

Names associated to pdg codes in Style.cxx (in lareventdisplay) are out of date?

12/05/2017 05:10 PM - Tracy Usher

Status:	Feedback		**Start date:**	12/05/2017
Priority:	Normal		**Due date:**	
Assignee:	Tracy Usher		**% Done:**	0%
Category:	Event Display		**Estimated time:**	0.00 hour
Target version:			**Spent time:**	0.00 hour
Experiment:	-			

Description

It has been noted that the event display can give some interesting products in neutrino interactions in argon. For example:

```
    1     0     0      #nu_{#mu}   794     794    -1 primary
    1     1     1        ^{56}Fe     0       0    -1 primary
    1     4     4            #mu   328     239     0 primary
    1     8     8              p   686     224     6 primary
    1     9     9        #pi^{+}    50       8     7 primary
    1    10    10              p   319      52     7 primary
```

Where it seems rather odd to expected an iron nucleus to be associated with a neutrino interaction in argon (right?).
These names are implemented in the Style.cxx file which does not appear to have been updated in eons leading to the question as to whether there have been changes in pdg codes which may be causing this problem? Conjecture on my part...

History

#1 - 12/05/2017 05:44 PM - Lynn Garren

Have you checked the PDG Monte Carlo numbering scheme page?
http://pdg.lbl.gov/2017/reviews/rpp2017-rev-monte-carlo-numbering.pdf

#2 - 12/05/2017 06:02 PM - Tracy Usher

Yes, hence the question mark on the subject line. While it seems that 1000260560 is, by pdg definition, Fe, it was pointed out to me by the person reporting this that it seemed an odd product from this interaction. So that begs the question if the code is consistent with the generators. If the answer is "yes" then happy to close the topic.

#3 - 12/06/2017 11:30 AM - Robert Hatcher

Looking at lareventdisplay / EventDisplay / Style.cxx LatexName() I don't see how it could get things "wrong" in the mapping from PDG code to name (to the limited extent that it does translations). Ion/isotope naming hasn't changed in many, many years (long ago it was A,Z rather than Z,A).

Well, actually there *is* a way to go wrong with this, but only if it falls through to the default case of using the static buffer and generating a "X_{..pdg..}" and there are multiple call that trigger that in the same "write".   But that doesn't seem to be the case here.

Perhaps, it would be better to look at the event itself in the MCTruth & Geant4 particle list structures to understand what is going on.
Are we sure that the volume that GENIE event generation was restricted to was in fact pure Argon and there wasn't the presence of other elements such as an APA frame or something made from Fe that the scatter could have occurred off of.

#4 - 12/06/2017 06:18 PM - Gianluca Petrillo

- Description updated

Is this the norm, or do you get iron only rarely?
Maybe that *is* iron, if your detector geometry is ironic enough.
Also: is that GENIE that you are printing?

#5 - 12/11/2017 10:28 AM - Lynn Garren

- Status changed from New to Feedback

Are you able to follow up Robert's recommendation to figure out where this problem occurs?

#6 - 01/10/2018 12:56 PM - Katherine Lato

- Assignee set to Tracy Usher