

## LArSoft - Bug #18329

### Potential Lack of Simulation of Recoil Nuclei in LArSoft

11/17/2017 12:41 PM - Michael Mooney

<b>Status:</b>	Assigned	<b>Start date:</b>	11/17/2017
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	Robert Hatcher	<b>% Done:</b>	0%
<b>Category:</b>	Simulation	<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>		<b>Spent time:</b>	0.00 hour
<b>Occurs In:</b>		<b>Co-Assignees:</b>	
<b>Experiment:</b>	MicroBooNE		

#### Description

Discussing with Steve Dytman and Gianluca Petrillo, we have concluded that there seems to be a lack of vertex information associated with status 15 particles coming out of GENIE, which have been identified as final state nuclear remnants. Gianluca also confirmed that only status 1 particles are simulated by GEANT and passed to LArG4, so, naively, it seems like recoiling nuclei associated with neutrino interactions are not being simulated in our MC - at least when using GENIE. While the contribution to the neutrino interaction energy scale may be small, this seems like something we want to study in our MC and ought to be simulating (if we are indeed not currently doing so).

The GENIE authors have been notified of this, but Gianluca suggested it would be appropriate to submit a LArSoft ticket on this matter.

#### History

##### #1 - 11/20/2017 10:29 AM - Lynn Garren

Gianluca will setup a meeting to figure out how to proceed.

##### #2 - 11/29/2017 02:15 PM - Gianluca Petrillo

- Status changed from New to Assigned

- Assignee set to Robert Hatcher

A meeting happened with Robert Hatcher, Michael Mooney, Steven Dytman, Gabriel Perdue, Erica Snider and Gianluca Petrillo. In there, GENIE agreed to explore a solution involving to better characterise the "hardonic blob" with atomic and mass number and electric charge, and make it digestible for Geant4. Our contact person will be Robert Hatcher.

##### #3 - 06/19/2018 01:43 PM - Katherine Lato

- Priority changed from High to Normal

We still want to see this done, changing priority to align with the development team's actual priority for this.