

dunetpc - Feature #15295

Make signal shaping service available in Root

01/24/2017 01:15 PM - David Adams

Status:	Assigned	Start date:	01/24/2017
Priority:	Normal	Due date:	
Assignee:	David Adams	% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:			
Description			
Convolution and deconvolution for the DUNE single-phase detector detectors is done with SignalShapingServiceDUNE. I would like to make this service available at the Root command line.			

History

#1 - 01/24/2017 01:23 PM - David Adams

- Status changed from New to Assigned
- Assignee set to David Adams

SignalShapingServiceDUNE has many features that cannot be parsed at the Root command line. I have introduced an interface `dune/DuneInterface/SignalShapingService` and made this a base class for `SignalShapingServiceDUNE`. I have not (yet) added service interface macros and so the fcl configuration of `SignalShapingServiceDUNE` is unchanged and the service cannot be accessed with `ServiceHandle<SignalShapingService>`. This can be added later.

`SignalShapingServiceDUNE` has template members for convolution and deconvolution and these cannot be inherited from the base. I add float and double interfaces for these methods to the interface and concrete classes.

`DuneServiceAccess` is modified to enable `GetServicePointer<SignalShapingService>` to return the `SignalShapingServiceDUNE` service.

I have verified all tests pass and committed these changes to `dunetpc 7dcd326153df34be32ead8731704ea7dca0ce209`.

#2 - 01/24/2017 01:59 PM - David Adams

In order to use the convolution or deconvolution, one must have the correct size for signal vector. `SignalShapingServiceDUNE` makes use of the `lardata` utility `SignalShaping` which throws an exception if this size is not the same as that returned by the `LArFFT` service. The latter is not available in Root and would require some effort. I will add a method to `SignalShapingService` and `SignalShapingServiceDUNE` that returns that size.

`SignalShapingServiceDUNE` (and `SignalShapingService`) provide access to the `SignalShaping` utility for a given channel and that utility provides access to its response function, filter and convolution and deconvolution kernels. It would be nice to access these in Root but `SignalShaping` cannot be parsed because its template function definitions make use of `ServiceHandle`. We can probably work around that by protecting those with `"#ifndef CLING"`. Gianluca would you object to me making that change?

#3 - 01/25/2017 07:27 AM - David Adams

The method to return the signal size (i.e. the vector length) is added in `dunetpc 804ce7aba7bc496ce267aca0d912730749e80311`.