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Progress of implementing Im-TOF reconstruction in STIR

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Classes: Scanner / ProjDataInfo / InterfileHeader

- Scanner / ProjDataInfo Class
 - New variables and relative control functions:
 - Int num_tof_bins
 - Float timing_resolution
 - Bool tof_compatible
 - New overloaded Constructors with TOF information
- New keywords in Template Header
 - Number of TOF bins :=
 - Timing resolution (in picoseconds) :=



Class: IterativeReconstruction

- New variables and relative control functions
 - Bool do_tof_reconstruction.
- New keywords in par files
 - do tof reconstruction := 1

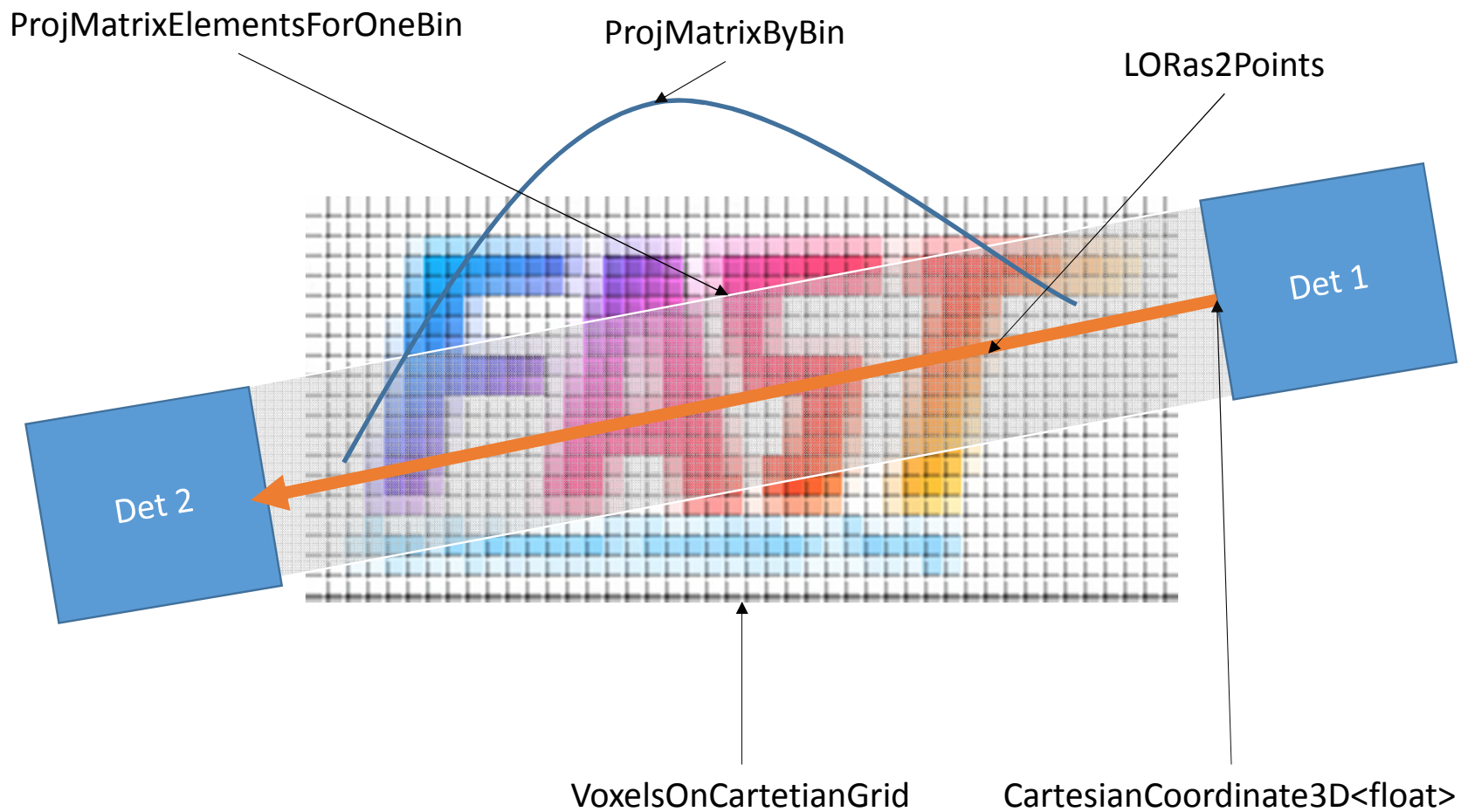


Class: ProjMatrixByBin

- New variables:
 - bool apply_gaussian
 - float gauss_sigma
 - shared_ptr<ProjDataInfo> proj_data
 - VoxelsOnCartesianGrid<float> image_info_ptr
- Control functions:
 - enable_tof(bool, float timing_resolution)
- New functionality:
 - get_line_connecting_dets(Bin, ProjMatrixElemsForOneBin)
 - get_gauss_peak_from_time_difference(float Dt, ProjMatrixElemsForOneBin)
 - modulate_lor_for_TOF_reconstruction(float peak, ProjMatrixElemsForOneBin)
 - get_gauss_value(float x, float peak)



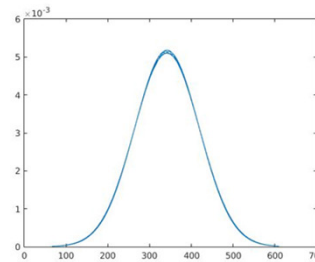
TOF implementation



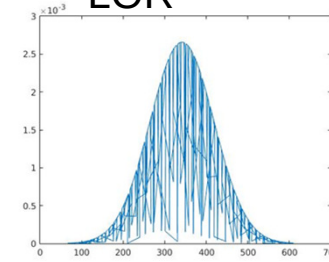


Initial results – One ray

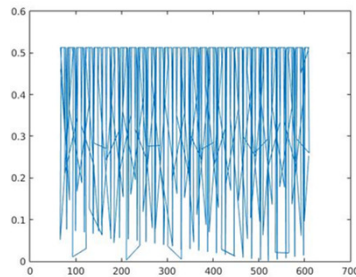
Modulation
Gaussian



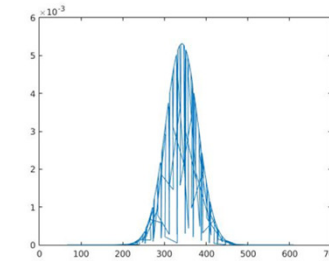
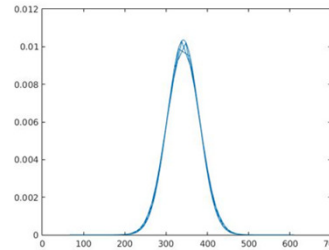
Final
LOR



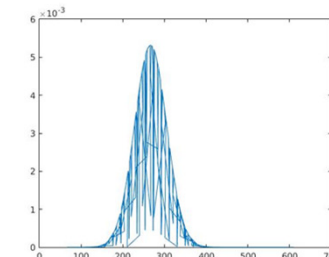
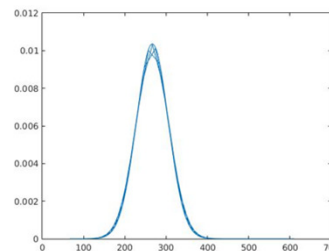
600 ps –
DT = 0 ps



Original LOR



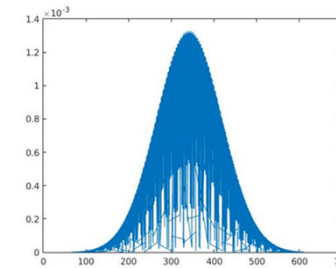
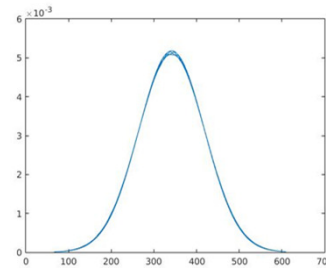
300 ps –
DT = 0 ps



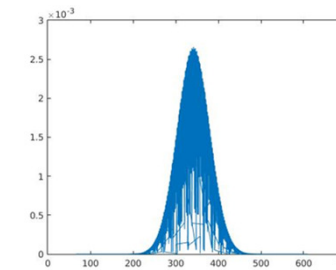
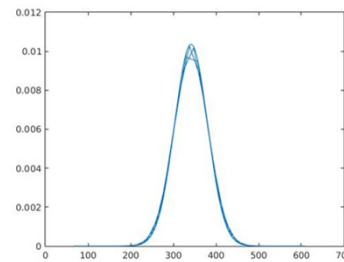
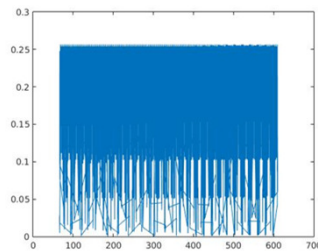
300 ps – DT
= 150 ps



Initial results – 10 rays

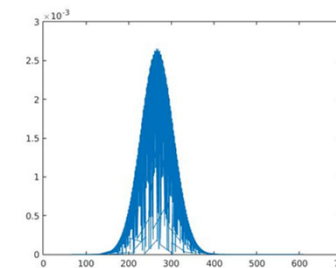
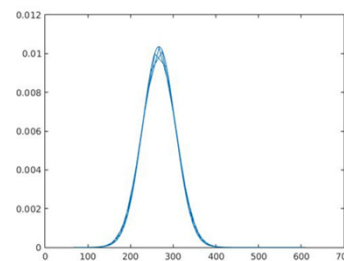


600 ps – DT
= 0 ps



300 ps – DT
= 0 ps

Original
LOR



300 ps – DT
= 150 ps



ROOT Im input (in progress)

- New Classes:

- `InputStreamFromROOTFile`
- `CListModeDataROOT`
- `CListModeRecordROOT`

- New files:

- `ROOTListModeInputFileFormat`

