**23 Feb 2019:**

Created repository.

Added files:

* AODGraphs.h
* beamline.h
* crypticontics.h
* getAccVectors.h
* loadAllDetectors.h
* runDatabaseArrays.h
* TOFDifference.h
* trackerScatter.h

Created file “all.h” consisting of all the above files in one file. The change was done to prevent the inconvenience of downloading and linking of new files on new systems.

Uploaded all.h to the repository.

**25 Feb 2019:**

**Created** file “Update Log.txt” to log updates to the repository,

Updated runDatabaseArrays.h

* *Feature Addition:* Function checkAmps() and findRuns() changed to accommodate just non-zero-amp runs if the user so desires, using ‘+’ in the place of double amps parameter.

*Example:*

To find all 5000 MeV/c runs without muon filter, but with non-zero amps.

findRuns(5000, ’+’, false);

Previously, to do the same required:

findRuns(5000, 60, false);

appendRunSelection(5000, 120, false);

appendRunSelection(5000, 180, false);

appendRunSelection(5000, 240, false);

* *Bug Fix:* Function getMaxEntriesIndexInSelection() changed so if parameter fast==true, it searches run database instead of loading all files.
* *Bug Fix:* Subsequent to the last point, if micromegas are required as specified, the file in question will be loaded regardless to allow for the function to find micromegas via t->GetListOfBranches()->FindObject("NBL4Smm1\_stripQ").

Updated all.h wrt the above edits.

Updated repository.

**26th Feb 2019:**

Updated trackerScatter.h

* *Feature addition:* Added (overloaded) function getHitPos() that takes five array parameters and fills in all detectors’ 3D hit positions.

*Example:*

To get hit positions:

getHitPos(dwc1pos, dwc2pos, dwc3pos, mm1pos, mm2pos);

Previously, to do the same required:

getHitPos(1, dwc1);

getHitPos(2, dwc2);

getHitPos(3, dwc3);

getHitPos(4, mm1);

getHitPos(5, mm2);

**Created** file accVectors.h. This is a cleaner version of getAccVectors.h with a few editions including new functions.

Updated AODGraphs.h

* *Feature addition:* Added drawAODTheoretical() to draw theoretical AOD vs Amps line as calculated by angleOfDeviation(). This gets called automatically at the end of AODGraphs() if “amps” is received for graphType parameter.
* *Note:* This should get updated to reflect AOD vs Momentum in the future as well.

Updated repository.

**4th March 2019:**

Updated AODGraphs.h

* *Feature addition:* Added drawAngleOfDeviationX(). This draws the angle of deviation in the XZ plane. Previously, one would need to run the AngleOfDeviation.C macro.
* *Note:* Changed the name of function AODGraphs() to drawAODGraphs(), in order to maintain naming conventions.
* *Feature addition:* In function drawAODGraphs(), graphs for graphType “momentum” and “momentumabs” now has a function fit for experimental results.
* *Feature addition:* In function drawAODTheoretical(), graphs for graphType “momentum” and “momentumabs” now has a function fit for theoretical results.
* *Note:* In function drawAODGraphs(), parameter bool toFit=true deleted due to redundancy (user would want to compare theoretical and experimental in most cases anyway).

Updated repository.

**6th March 2019:**

Updated trackerScatter.h

* *Feature addition:* Functions MMScatter(), DWCScatter(), and detector(), have a new optional parameter bool newCanvas which can be called to draw a new square canvas while drawing scatter plots. This is true by default.
* *Note:* Function trackerScatter() has been changed to reflect changes in the above.

Updated AODGraphs.h

* *Feature addition:* Created function drawAODGraphs3D(), which first finds runs, then draws a 3D scatter plot to reflect *Momentum vs Amps vs AOD* for all selected runs.
* *Note:* Current finding procedure needs to be optimised. Currently, it uses findRuns() as well as appendRunSelection() to write to runSelection[]. It is possible to search for all runs using findRuns(ALL,<amps>...) but those also include two 600 MeV/c runs, are not helpful to us at the moment. One of those files is also not in my local data set, and that needs to be included to avoid a crash.
* *Note:* The possibility of drawing a surface based on this, and subsequently, a fit needs to be discussed for necessity. If decided necessary, this should be included.
* *Bug Fix:* Deleted Line 75 : toFit=false; (refer to updates on 4th March)
* *Note:* Function drawAODTheoretical() needs to be optimised.

Updated repository.

**14th March 2019:**

General updates about the meeting with Cristovao on the 8th of March 2019:

* *Note:* Zero ampere runs need to be calculated and accounted for while drawing AODGraphs(). This seems to be the disparity between the different offsets between theoretical and experimental data fits.
* *Note:*  AODGraphs() needs to draw TGraphs and not TH2Ds, and include errors in the fit. One standard deviation should be considered as an error in AOD.
* *Note:* Small z value and inaccurate y value are indicative of instrument error and fit theoretical calculations.

Work was done locally on trackerScatter.h and AODGraphs.h but not uploaded due to instability and inaccuracy.

File all.h updated and uploaded but should not be trusted as stable or accurate as it includes the new versions of trackerScatter.h and AODGraphs.h. Use an earlier version if using functions in AODGraphs.h.