

# Gait\_Symmetry\_Measures

## Linear Global Gait Asymmetry Index

Inspect3D offers a Linear Global Gait Asymmetry Index (LGGA) calculation that allows the users to find LGGA scores using left/right Link\_Model\_Based signals in the underlying CMZ data. Further information on LGGA can be found [here](#). The LGGA scores are stored in the underlying c3d data files and are queried into Inspect3D for each CMZ workspace.

### Dialog



The LGGA dialog can be accessed by selecting the symmetry icon in the main toolbar  once a library has been loaded.

The top of the dialog, "LGGA Settings File:", allows the user to save and load LGGA definitions. As long as the loaded library has the same event and signal names as saved in the LGGA settings, the settings file may be applied to different data sets or processing sessions.

The signal type tab is inactive as the user is restricted to Link\_Model\_Based based kinematic and kinetic measures for the LGGA at this time.

The signal folder tab allows the user to select which folder within their Link\_Model\_Based data type to draw signals from.

The LGGA compares left and right signals within gait cycles. The LGGA dialog lets the user decide which events they wish to define gait cycles with.

The left signal multi select window allows users to choose from the list of existing signals in the underlying model, based on the signal type and folder chosen. Here, Inspect3D only allows the left signals to be selected, and the matching right signal will be selected automatically. This prevents the user from mistakenly selecting signals that do not match. Inspect3D will also only display signals that has found a right and left match more.

The pelvis and trunk signal selections default to empty. If the user wishes to include a pelvis or trunk kinematic or kinetic measure within the LGGA calculation, they can be selected from a list of general signals identified in the Link\_Model\_Based folders.

The checkbox "compute query after calculation" may be checked by users if they want the LGGA results to be automatically queried into Inspect3D after the calculations are complete.

The checkbox "use signal magnitude for LGGA" may be checked by users if they wish to compute one asymmetry score for each signal using the signal length. If unchecked, Inspect3D will produce an asymmetry score for each X, Y, Z component of the selected signals.

## Display Results



If the user chooses to query the LGGA results, two groups will be generated in the Inspect3D groups window. The LGGA1 group shown is the total Linear Global Gait Asymmetry measure, a single metric per c3d file describing the combined asymmetry scores of the Link\_Model\_Based signals used to define the LGGA.

The LGGA1 Components includes sub-groups for each Link\_Model\_Based signal in the LGGA definition, containing the individual LGGA scores of each signal per c3d file. A user may wish to compare the contributions of the individual components to the total LGGA score.

The LGGA results are numbered when automatically queried into Inspect3D to prevent overriding previous LGGA calculations. If Inspect3D detects that one or multiple LGGA scores have already been computed for the underlying data set, the new LGGA will be numbered accordingly. Users may utilize this to compare LGGA scores with varying definitions.

LGGA values are stored as metric signals, and can be plotted in Inspect3D. The following figures show two examples of ways to compare total LGGA scores and individual LGGA components between subjects. Further Queries could be defined to compare different conditions or sub-groups in the data set ([defining queries](#)).



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