Track Reconstruction The first stage of our reconstruction algorithm is the reconstruction of the track of the prima
First Attempts at a track reconstruction were made using the standard approach. Here we assume we know the
Reconstruction with the **Ionization Electron Map** (from now on referred to as *the map*) uses simulation of the d
The **Discrete Reconstruction** is made using the map, instead of reconstructing the exact position of each electro
redReconstruction of one track simulated with microscopic tracking in Garfield++.
First Attempts redUsing the same method as in standard TPC (calculating z from the drift time). Gas compositio
[width=0.5]$9010_{z}t.pngDependenceofthe\ drifttimeonthe$ z $coordinatein90$ % $argonand10$ % CO_2 atmosphere, fitted wi
[width=0.5]$9010_{x}z.pngFirstattemptata\ trackreconstructionusingonlythe\ driftvelocity.Thisapproachworkswellina\ sta$
[width=0.5]$9010_{r}es.pngFirstattemptata\ trackreconstructionusingonlythe\ driftvelocity, residues.redSwapforbetterim$
Ionization Electron Map redExplanation of the map. Simulated on MetaCentrum, workload distribution between m
[width=0.5]$\mathrm{map}_{9}010_{g}en.pngExampleofmapgeneration.redSwapforbetterimage, correctcoordinates.$
[width=0.5]$9010_{r}eco.pngExamplereconstructionwiththemap.redSwapforbetterimage, correctcoordinates.$
Gradient Descent Search redGradient descent search of a point in the original space that gets mapped to the given
Trilinear Interpolation red
Explanation of trilinear interpolation.
Interpolating in the Inverse Grid redInterpolating between known points in the readout space. Gaussian eliminatio
[width=0.8]interpol.png Selection of the points for interpolation. redCreate better images, use the explanation interpola
Discrete Reconstruction redReconstruction with pads and time bins. Maybe testing different pads.
Energy Reconstruction The second stage of our reconstruction algorithm is the reconstruction of the particle's ener
The **Cubic Spline Fit** is a rejected attempt at the reconstruction of energy. It uses smoothly connected piecewise
The **Circle and Lines Fit** was chosen as an alternative since this corresponds to the shape of a trajectory of a ch
The **Runge-Kutta Fit** uses the 4th order Runge-Kutta numerical integration described in section **??**. Initial para
[width=0.5]$9010_{3}d.pngExampleofa\ fittedreconstructedtrack.redSwapforbetterimage.$
Cubic Spline Fit redBad attempt at energy reconstruction using cubic splines.
[width=0.8]$9010_{s}plines.pngFirstattemptata\ trackreconstructionusingonlythe\ driftvelocity.Splineenergyreconstructi$
Circle and Lines Fit redEnergy reconstruction with circle and lines fit. Trilinear interpolation of the magnetic field.
[width=0.8]circlefit.png Circle and Lines Fit 3D geometry. redSwap for better image.
[width=0.8]$9010_{c}ircle2D.pngFirstattemptata\ trackreconstructionusingonlythe\ driftvelocity.CircleandLinesFitin2D$
Runge-Kutta Fit redSingle parameter fit with 4th order Runge-Kutta simulated track. Future testing with microsc
Conclusion redHere or at the end of each section.