

# Status of LArSoft Cosmic Ray Monte Carlo (in MicroBooNE)

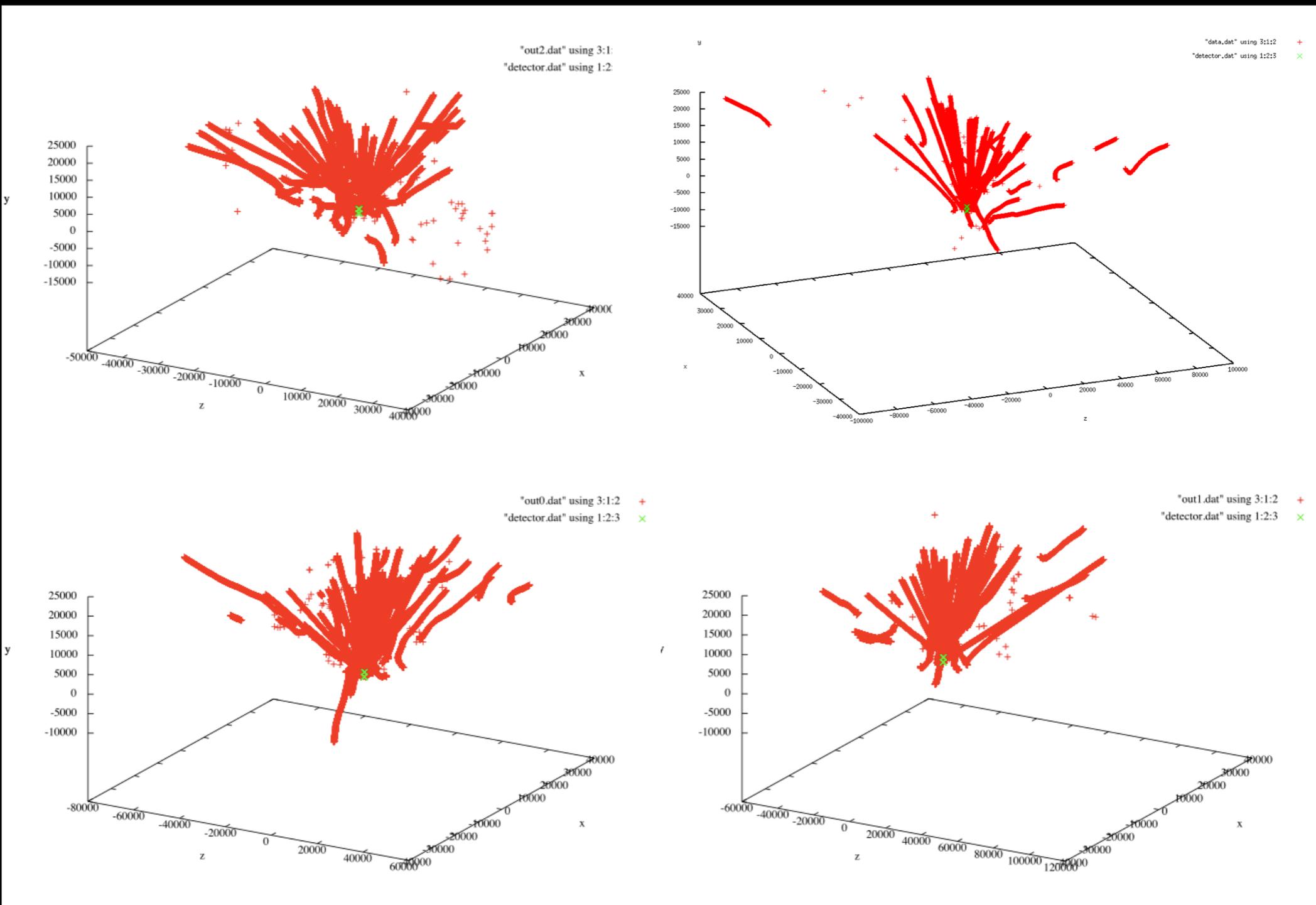
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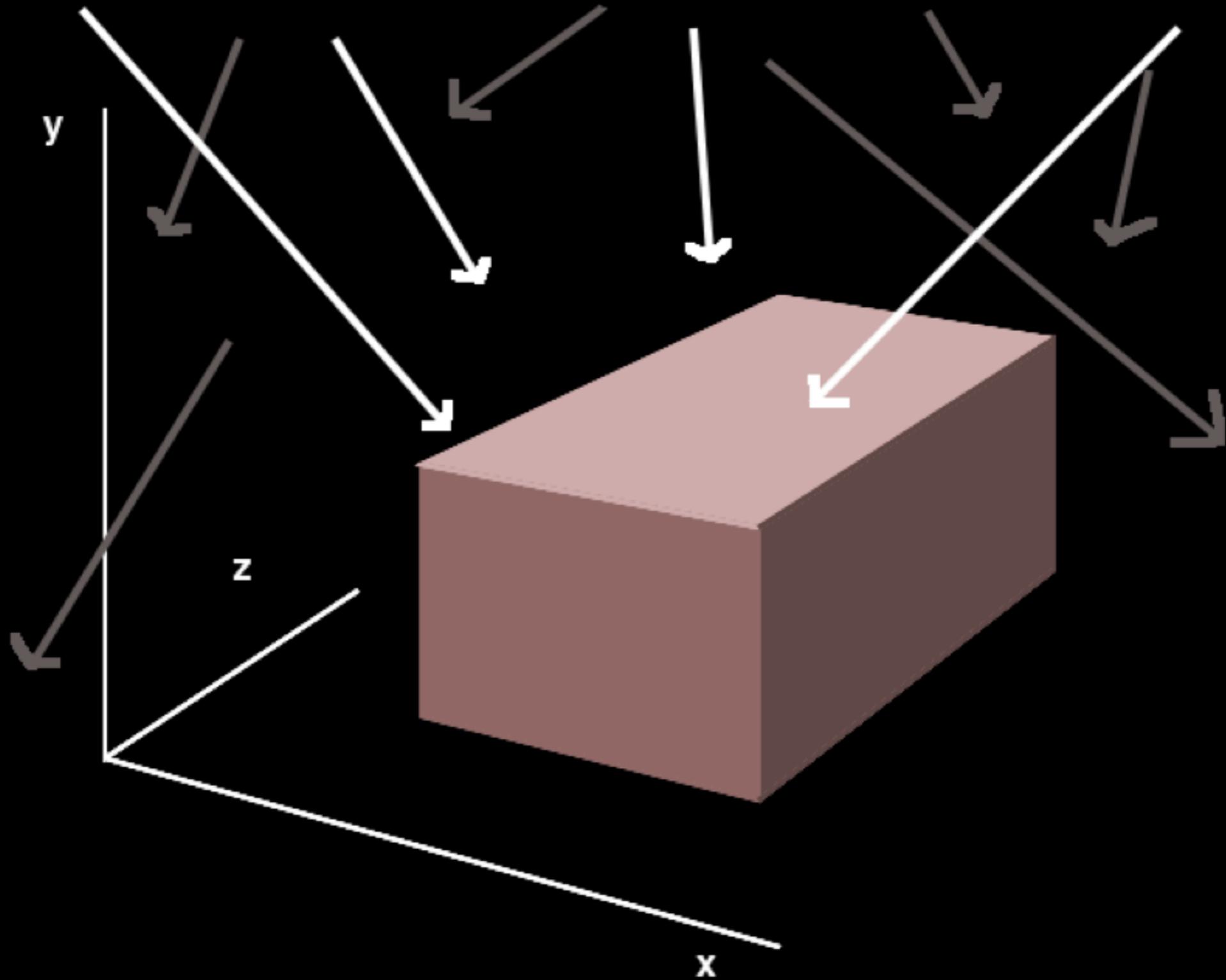
# things

- Initial troubles running with CosmicGen and CRYHelper
- Monday---first successful run!
- Two new methods `geo::CrossesBoundary()` and `Geometry::CrossesVolume()`
- Currently, only accepting primaries---need to work on general version of LAr20MuonStacking

# how it looks so far



# CrossesBoundary



# CrossesBoundary

```
/// Determine whether or not track intersects box of volume:
/// ( x_hi - x_lo ) x ( y_hi - y_lo ) x ( z_hi - z_lo )
///
/// \param x_hi - x box coordinates in space w.r.t. the origin
/// \param x_lo - x box coordinates in space w.r.t. the origin
/// \param y_hi - y box coordinates in space w.r.t. the origin
/// \param y_lo - y box coordinates in space w.r.t. the origin
/// \param z_hi - z box coordinates in space w.r.t. the origin
/// \param z_lo - z box coordinates in space w.r.t. the origin
/// \param x0[] - initial position of the particle
/// \param gradient[] - initial gradient of particle position
/// \param track_length - length of track
///
/// *** assumes particle's track is linear
///
bool CrossesBoundary ( double x0[],           // initial particle position
                      double gradient[],    // initial particle gradient
                      double x_lo,         // -
                      double x_hi,        // |
                      double y_lo,        // |- box coordinates
                      double y_hi,        // | (make into vectors?)
                      double z_lo,        // |
                      double z_hi,        // -
                      double point[] )     // point of intersection
{
```

# CrossesVol

```
bool Geometry::CrossesVol( double xyz[],
                          double dxyz[],
                          double point[] )
                          // double track_length )
                          // std::String volname="volTPC" )
{
    double tosurface = 2000;
    //double extra = 1000;
    double extra = 10000;
    double x_lo = 0 - extra;
    double x_hi = 2*this->DetHalfWidth() ;
    double y_lo = -this->DetHalfHeight() - extra - tosurface;
    double y_hi = this->DetHalfHeight() - extra - tosurface;
    double z_lo = 0 - extra;
    double z_hi = this->DetLength() + extra;

    return CrossesBoundary(xyz, dxyz, x_lo, x_hi, y_lo, y_hi, z_lo, z_hi, point);
}

} // namespace geo
```

want to set  
depth?

how much  
padding?

# LAr20MuonStacking

- I've set to only track primary muons---was having issues with other particles
- Current code written specifically for Eric's LAr20 muon study, needs to buff up
- Need more complete particle track identification
- This is the next point of attack on memory overload
- Can't do much MC on Condor until this is fixed..