FTPC Cluster Finding

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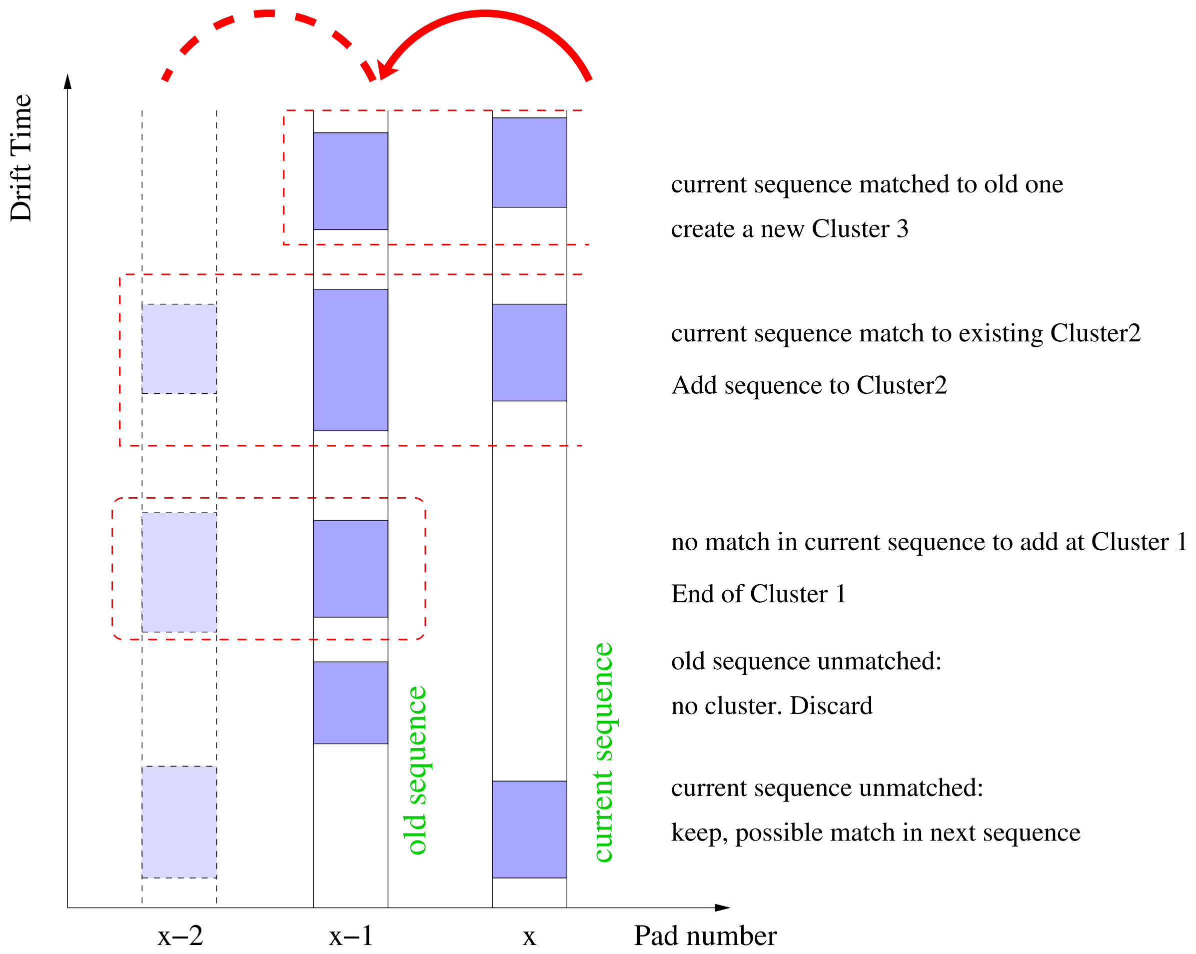
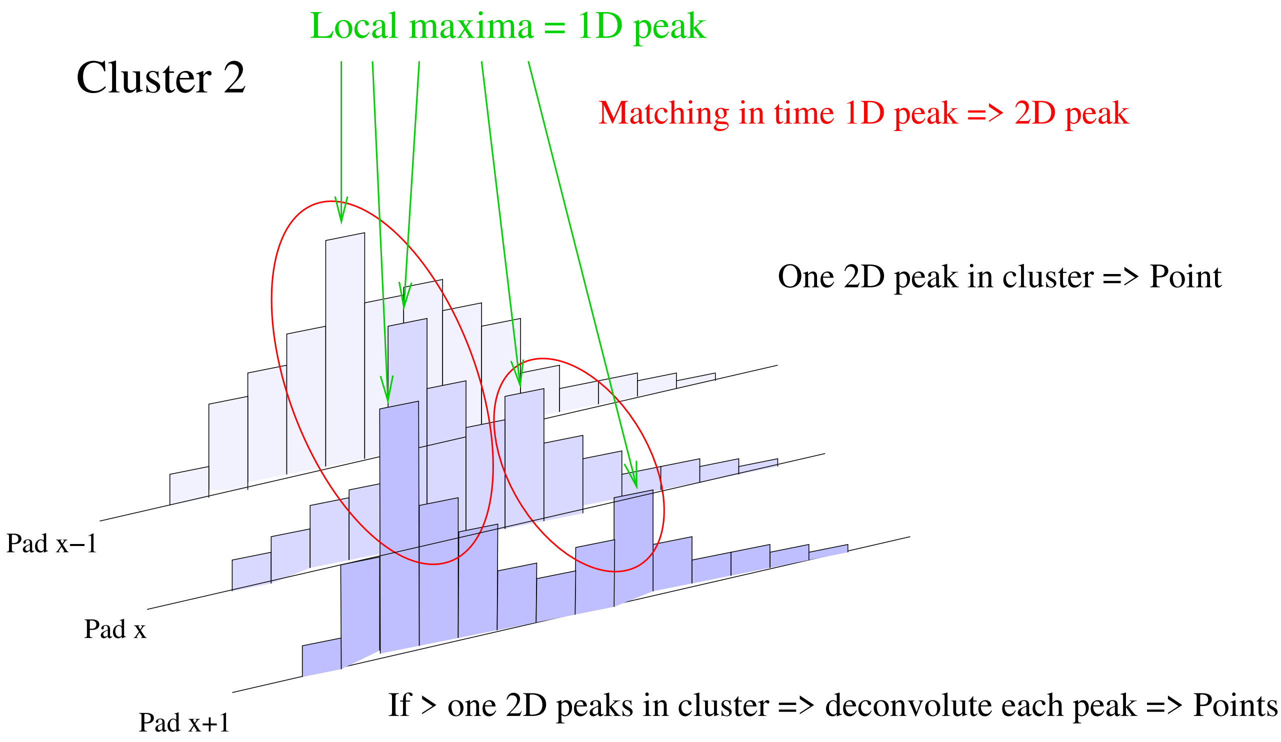
The FTPC cluster finding is done in StFtpcClusterMaker

Find Clusters

A cluster is a coherent area of non-zero charge. Very fast because it doesn't use ADC values.



Deconvolute Clusters and Fit to Points



Uses StFtpcPoint class constructor to be filled directly from the cluster finder

```
StFtpcPoint( Long_t   row,
             Long_t   sector,
             Long_t   n_pads,
             Long_t   n_bins,
             Long_t   max_adc,
             Long_t   charge,
             Double_t x,
             Double_t y,
             Double_t z,
             Double_t x_err,
             Double_t y_err,
             Double_t z_err,
             Double_t s_phi,
             Double_t s_r,
             Long_t   flags);
```

Point → STAF table fcl_fppoint

```
struct fcl_fppoint {
 long  row;        /* FTPC row number */
 long  sector;     /* FTPC readout sector number */
 long  n_pads;     /* number of pads in cluster */
 long  n_bins;     /* number of consecutive timebins in cluster*/
 long  max_adc;    /* cluster peak height (adc channels) */
 long  charge;     /* cluster charge (adc channels) */
 long  flags;      /* bit0:unfolded, bit1:unfold failed, */
                   /* bit2: saturated, bit3:bad shape, */
                   /* bit4:cut off, bit5:tracked */
 float x;          /* x-position of hit */
 float y;          /* y-position of hit */
 float z;          /* z-position of hit */
 float x_err;      /* x-position error of hit */
 float y_err;      /* y-position error of hit */
 float z_err;      /* z-position error of hit */
 float s_phi;      /* cluster sigma in pad direction */
 float s_r;        /* cluster sigma in drift direction */
};
```

Transformation of Pad/Time into STAR Coordinate System

Pad,Time $\rightarrow$ radius,ϕ $\rightarrow$ x,y,z

z $\leftarrow$ Geometry_ftpc/ftpcPadrowZ
$\leftarrow$ construction + survey measurements

The standard STAR coordinate system[1] is defined by:

The origin is located at the center of the solenoid

Positive x is south

Positive y is up

Positive z is west

[1] CSN0121 "STAR Coordinate System", Howard Matis