

# ACD Tile Numbering

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The LAT coordinate system and numbering schemes for the subsystems are described in a LAT project document. The ACD subsystem numbering scheme is not yet defined, and must be added to that document. After discussions with Heather and Dave, here is a proposal. Comments and changes are welcome.

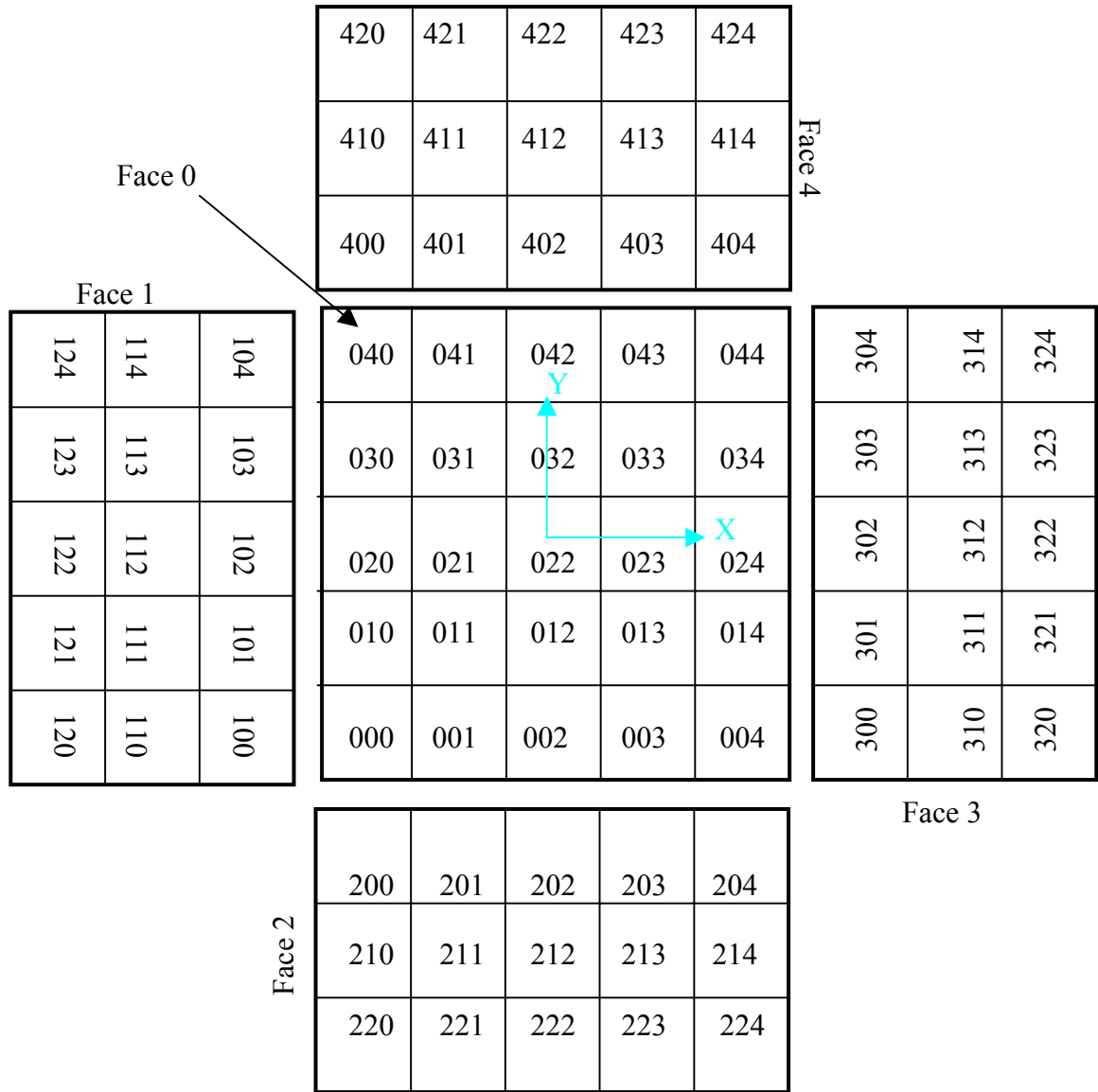
The numbering scheme serves several purposes. In software, the numbering scheme is used for storing the information about an event (both simulation and real data) and it is also used in the reconstruction and analysis. In hardware, the numbering scheme is used in the design, fabrication and test.

An ACD **face number** is defined. Face 0 is in front of the TKR, and is sometimes called the “top” or the “hat”. The side faces are numbered (1, 2, 3, 4) for the (-X, -Y, +X, +Y) faces, respectively. See the LAT coordinate system document for reference.

## ***Tile numbering***

The ACD is shown below, unfolded for a two-dimensional representation. The details of the lowest (back-most) rows of tiles are not shown, and the scheme can accommodate any version considered thus far.

A matrix numbering scheme will be useful for calculating nearest neighbors or other analyses. A four-digit matrix number uniquely specifies a tile. The least significant digit gives the column number, the next digit gives the row number, and the next digit gives the face number, as shown below. The side rows are numbered from the front backward, to minimize sensitivity to unresolved design decisions on the back row(s) segmentation, and the side columns are numbered along the respective (+X or +Y) axis.



A fourth digit, the most-significant digit, gives the PMT channel (primary or redundant), or the layer number in the case of the two-layer design. In the two-layer design, the inner layer is layer 0 and the outer layer is layer 1. The figure therefore shows the numbering for the inner layer or the primary PMT. The complementary layer or PMT would have a “1” in front of every number in the figure.