2d data decomposition

parametric description

global number of grid points
nx,ny,nz

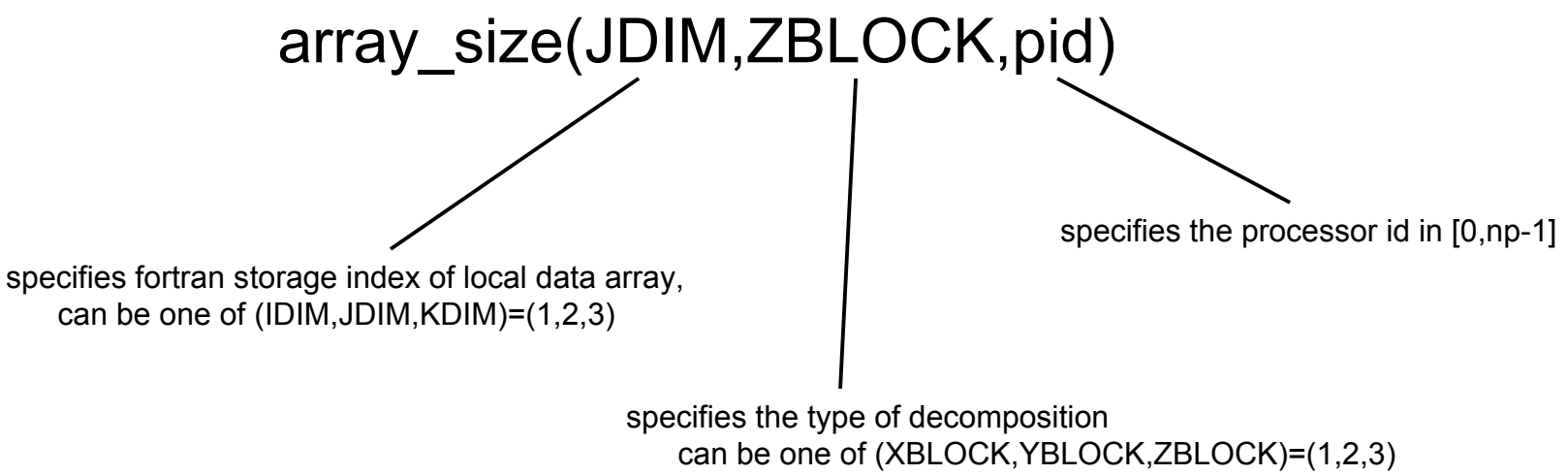
decomposition of coordinates across processors

layout(:,XBLOCK) = (/1,p1,p2/) ===> y coordinate split by p1, z coordinate by p2
layout(:,YBLOCK) = (/p1,1,p2/) ===> x coordinate split by p1, z coordinate by p2
layout(:,ZBLOCK) = (/p1,p2,1/) ===> x coordinate split by p1, y coordinate by p2

assignment of coordinates in local data arrays

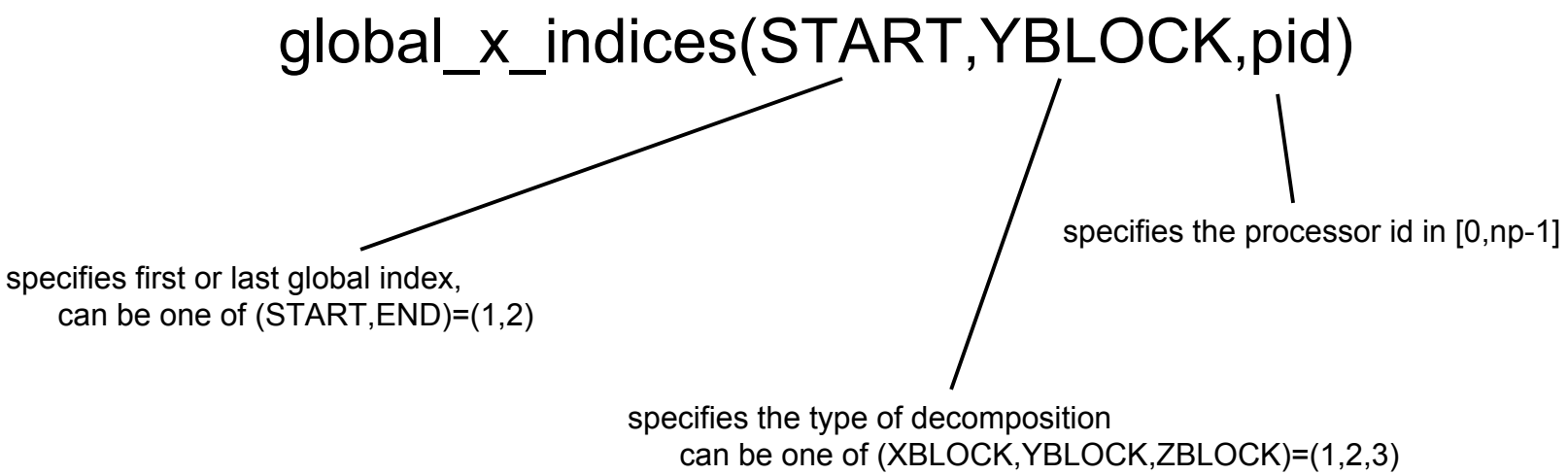
mem_order(:,XBLOCK) = (XCOORD,YCOORD,ZCOORD) (i,j,k) <===> (x,y,z)
mem_order(:,YBLOCK) = (YCOORD,XCOORD,ZCOORD) (i,j,k) <===> (y,x,z) (HOME)
mem_order(:,ZBLOCK) = (ZCOORD,XCOORD,YCOORD) (i,j,k) <===> (z,x,y)

2d data decomposition
parametric description



array_size(JDIM,ZBLOCK,pid) gives the number of elements in the second fortran array dimension for a local data array f(:,:,:) stored on processor pid in ZBLOCK format.

2d data decomposition
parametric description

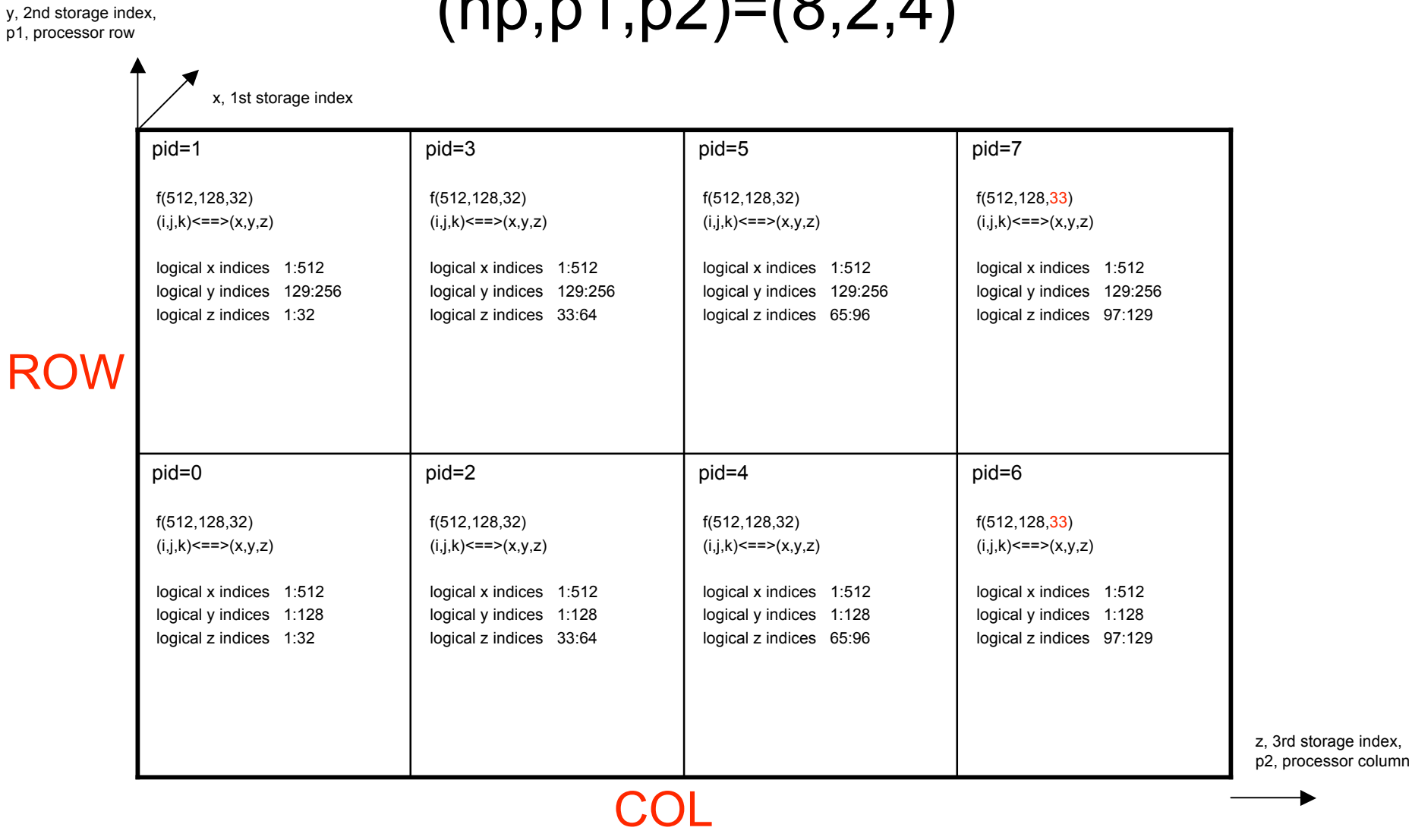


global_x_indices(:,YBLOCK,pid) gives the first and last logical, global x indices corresponding to the subset of the x coordinate dimension for a local data array f(:,:,:) stored on processor pid in YBLOCK format. The arrays global_y_indices and global_z_indices are also initialized in src/decomposition2d.f90.

XBLOCK example:
(nx,ny,nz)=(512,256,129)
(np,p1,p2)=(8,2,4)

mem_order=(xcoord,ycoord,zcoord)

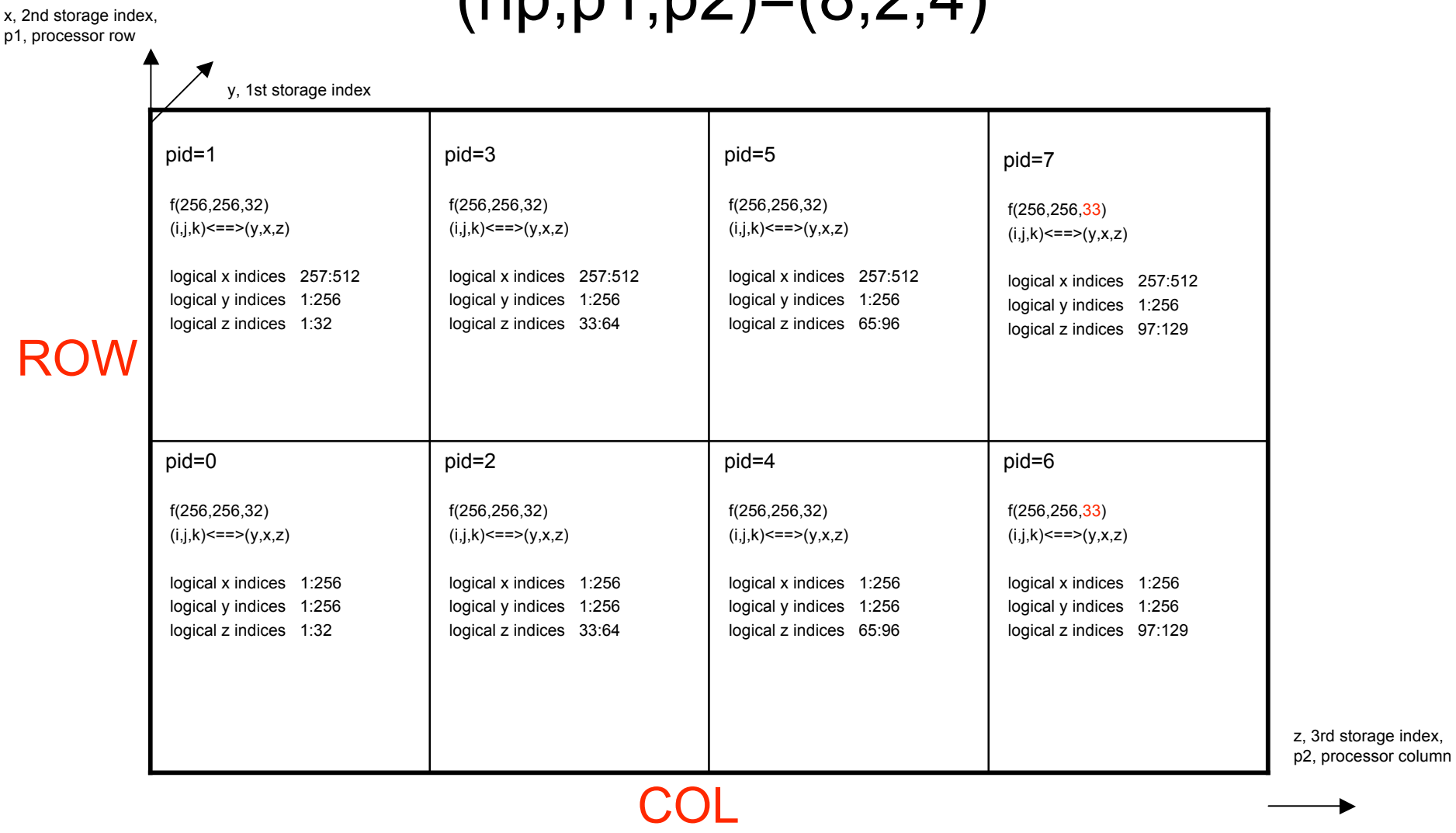
layout=(1,p1,p2)



YBLOCK example:
(nx,ny,nz)=(512,256,129)
(np,p1,p2)=(8,2,4)

mem_order=(ycoord,xcoord,zcoord)

layout=(p1,1,p2)



ZBLOCK example:
(nx,ny,nz)=(512,256,129)
(np,p1,p2)=(8,2,4)

mem_order=(zcoord,xcoord,ycoord)

layout=(p1,p2,1)