

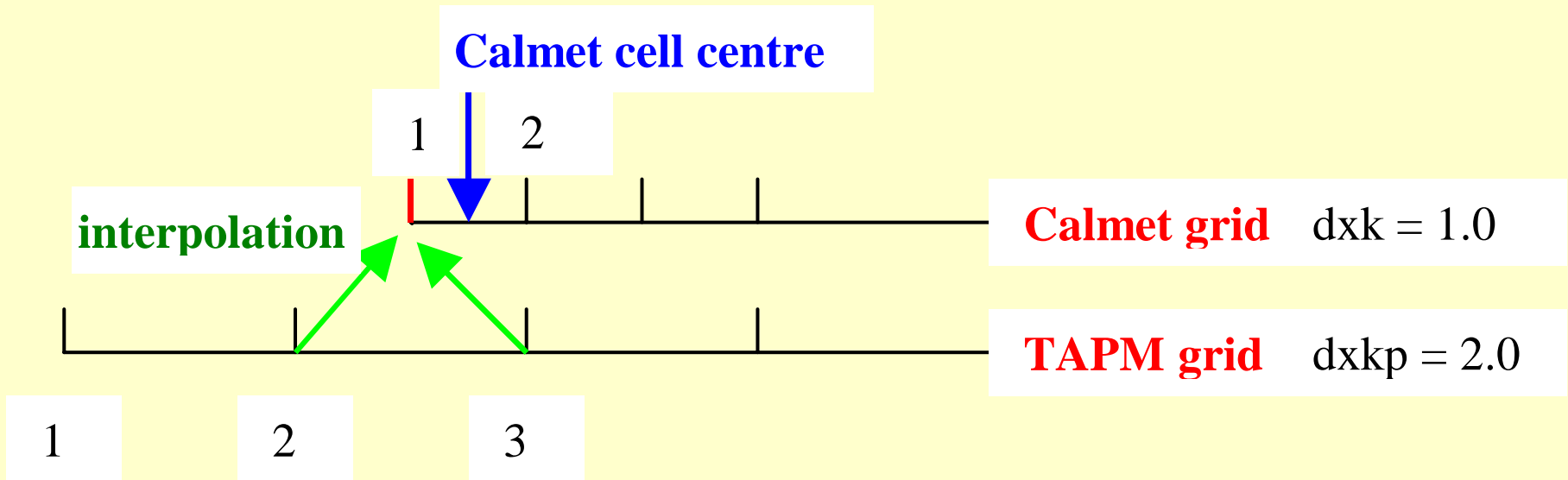
# Calmet questions

- Is there a problem with how Calmet interpolates CSUMM output onto the Calmet grid, which has implications for using a CSUMM format file to put TAPM output into Calmet?
- Check the timestamp convention for CSUMM files.
- Isn't it time we had a more robust method for getting TAPM 3-D met output (not just winds) into Calpuff?

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# How Calmet interpolates a CSUMM file from TAPM onto the Calmet grid (I think??)



Interpolation should be done to cell centres, not grid points. Calmet appears to interpolate CSUMM to grid points but then take the values as applying to cell centres. So, for example, the contribution of TAPM winds from grid point 3 will be under-weighted at the first cell centre (blue arrow).

# How to fix (if I am right)

- fix subroutine PROGRD in Calmet, OR
- fudge correct results by creating a CSUMM file from TAPM but specifying false TAPM coordinates shifted  $0.5 \times \text{Calmet-cell-width}$  down and to the left from the actual TAPM coordinates. This will translate to false CSUMM coordinates. So the weighting which Calmet applies to Calmet grid points will in fact be correct for cell centres. A CSUMM file created in this way will be correct for one value of Calmet cell width only.

# CSUMM timestamp convention

Is the timing convention of CSUMM output the same as Calmet / Calpuff , i.e:

hours 1, 2, 3,.....,22, 23, 0 (next date)

comprise a calendar day, where the numbers are end times of hours?

Isn't it time we had a more robust  
method for getting TAPM 3-D  
met output (not just winds) into  
Calpuff?

What are the options?

# optional slide

Calmet code showing interpolation of  
MM4/5 output to cell centres, not  
grid points

*In subroutine rdmm4 (and corresponding for MM5) there is the following code (##### added to identify important lines):*

```
C      INTERPOLATE PROGNOSTIC SOUNDINGS HORIZONTALLY TO DIAGNOSTIC MODEL
C      GRID
C      . (deleted lines)
C
C --- Compute cell center x,y of diagnostic grid cell (1,1) #####
C
C --- Compute diagnostic grid coordinates in real space
      xorigcc = xmap0 + (0.5 * dxk) #####
      yorigcc = ymap0 + (0.5 * dyk) #####
C
C
C --- Loop over diagnostic grid
      do 125 j = 1,ny
C --- Compute Y of cell center #####
      y = yorigcc + (j - 1) * dyk
      do 125 i = 1,nx
C --- Compute X of cell center #####
      x = xorigcc + (i - 1) * dxk

C --- Interpolate horizontally from prognostic grid to diagnostic
C --- grid x,y using inverse distance squared at four nearest points.
C
      do 126 k = 1,nz
          call r2interp(i,j,x,y,udat,k,uprog(i,j,k)) #####
          call r2interp(i,j,x,y,vdat,k,vprog(i,j,k)) #####
      enddo
C
etc.....
```