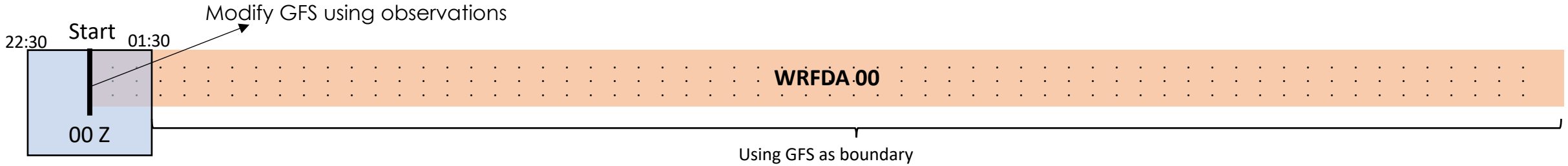
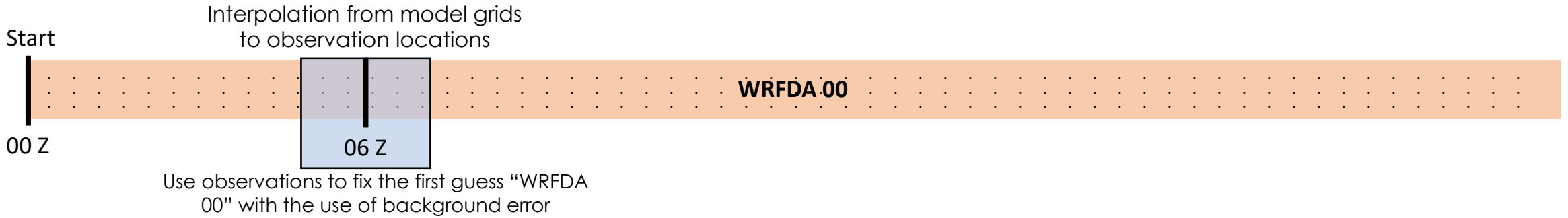
Data assimilation is the technique by which observations are combined with an NWP product (called the first guess or background field) and their respective error statistics to provide an improve (the analysis) of the atmospheric state. This contains the "first guess" for each time step after 03 UTC. This data is gridded. In this example, the assimilation made for each hour was independent of the previous assimilations; the corresponding background condition only incorporated information from the GFS global simulation. This is called a "cold start"

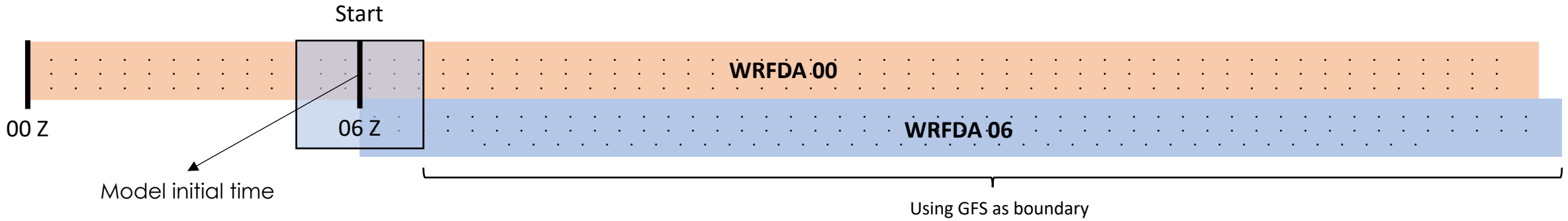


To produce WRFDA 06: Take the observations from 4:30 to 7:30



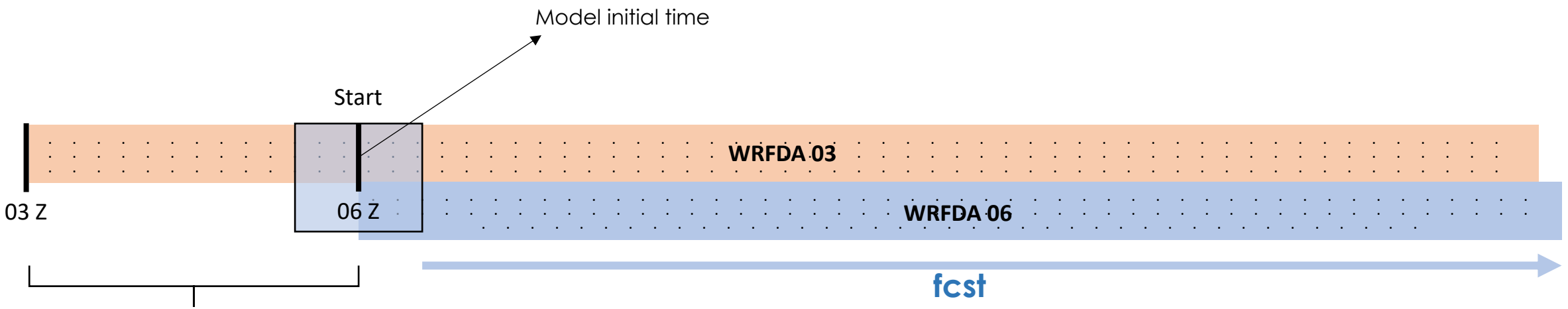
Observations at 06 UTC are now fixed using 03 DA. Errors at the stations are fixed.

Boundary data (GFS) is now used to update the boundary especially the outer domain for the time steps



Why is this done? To improve the spin-up problems from the cold start initial conditions

00?



GFS analysis used to avoid the bias drift in the data void area

What does this mean? When including boundary, you might get drifts (shifts in a wave/flow of pressure system) GFS avoids those shifts because its global