

Met briefing, AM 041029

Overall Weather Outlook

Consistent with previous forecast runs, the basic upper level west coast trough/east central US ridge pattern is being flattened by a strong short wave that is propagating east-northeastward. As of 12Z this morning this short wave is sitting over Wyoming at 500 mb. By flight time (18Z), we expect a strong low pressure system (at low levels, which will be slightly ahead of the upper level strong short wave) over South Dakota. A cold front curves southeastward and then southwestward. This will not affect our immediate area directly. However, moist air ahead of the front will lead to thunderstorm chances late in the day on a northeast-southwest diagonal across Missouri into northeastern Oklahoma. Though the model forecasts only low clouds over the northern part of our flight track (first plot), those thunderstorms might give some cirrus outflow at higher levels. There is a good chance this won't happen until the aircraft returns.

The strong short wave will move east-northeastward quickly, so by late Saturday the main trough in the west will start to move eastward at upper levels. This can be interpreted as an effect of the strong short wave, which is bringing in a substantial amount of cold air behind it (into Colorado and Utah). The movement of the main trough is largely consistent with previous model runs in its timing, and the effect on our area by Sunday will be to bring in stronger dynamics. This means a greater chance for lifting driven by the large scale motion, which can trigger showers out of the warm moist air over us. By Sunday, it will probably be cloudy with a 40% chance of showers and thundershowers – going to 50% by Sunday night. The implication of this is that we may not want to land too late on Sunday. The main trough starts to have decisive effects on our weather by Monday, as it moves through in that time frame. Expect 70% chance of rain on Monday, with a good chance of convective showers on Tuesday. The effect of this frontal passage on our weather is considerable, as another pulse of cold air moves south into Texas. Wind directions will be from the north by Tuesday and it will be quite a bit cooler than the highs we have been reaching (by 15-20 degrees F).

PV feature of interest for today's flight.

Today's flight will examine a feature in the potential vorticity of the lower stratosphere, which is shown in the second plot following this text. This feature, which is over southwestern Missouri, may have moved slightly north since the last model run.

Clouds and RH Sunday:

The third plot shows total cloud cover and the 500 mb dynamics for late Sunday. Around the northern part of the Aura flight track is thick cloudiness associated with the moving trough. The cloudiness over the Gulf is mostly low clouds. All of this is consistent with previous model runs, except that positive vertical velocities penetrate more into our area than suggested by previous runs. Again, we probably don't want to land too late on Sunday. The low clouds over the Gulf are due to enhanced relative humidity (fourth plot), which, in turn is related to the eastward movement of the high. Recall that a few days ago it was centered over Mississippi. On Sunday it is expected to be in the Atlantic.

So, the central Gulf will be in a region of northward motion, advecting moisture and warm air northward. Today the high is over the Florida panhandle, and though clouds are predicted to be minimal (first plot again), the visible satellite imagery already shows substantial amounts of puffies in most areas of the Gulf. It is likely to be worse on Sunday.

Runs for Tuesday did not come in this morning, so I have no report on that. However, the Aura track will be even further east (crossing 30 degrees at 86 west) than on Sunday.

For those interested, good displays of model runs are available at the following web sites.

<http://weather.cod.edu/forecast/>
<http://www.rap.ucar.edu/weather/model/>

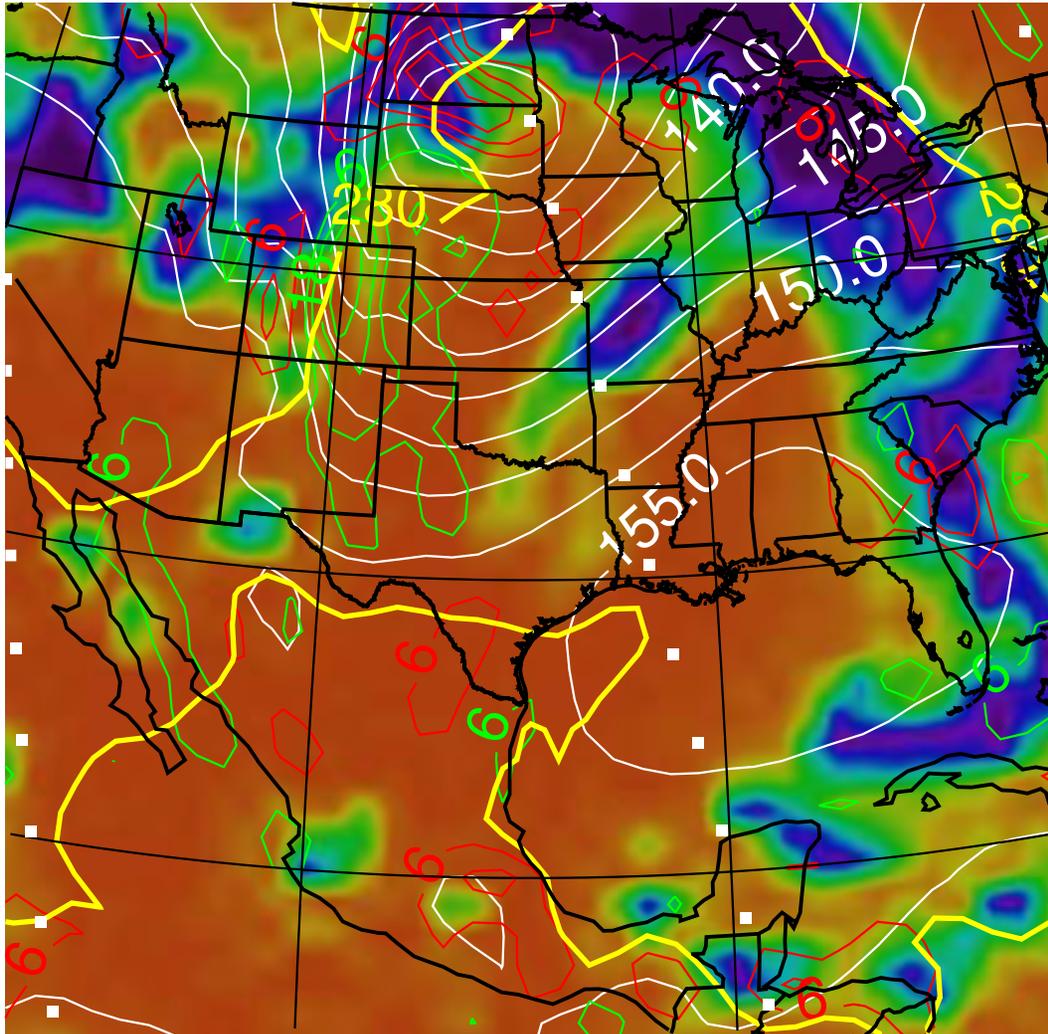
Cloud forecasts (other than the plots we are generating):

<http://maps.fsl.noaa.gov>
<http://www.arl.noaa.gov/ready/cmet.html>
https://afweather.afwa.af.mil/met/met_home.html (IE only)

Sites designed for this experiment (general met products, cloud forecast products, and satellite picture loops)

http://code916.gsfc.nasa.gov/Missions/AVE/2004-10/ave_main.php
http://bocachica.arc.nasa.gov/AVE/new_forecasting.html

18 UTC on 29 October, 2004 at 850.0 mb

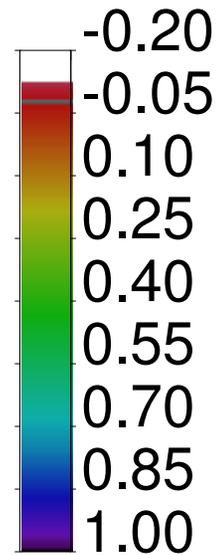


NMC, Grid: GG1X1

Seq: E01, Spec: SAVN170L42

18 hr fcst

Low CF ()



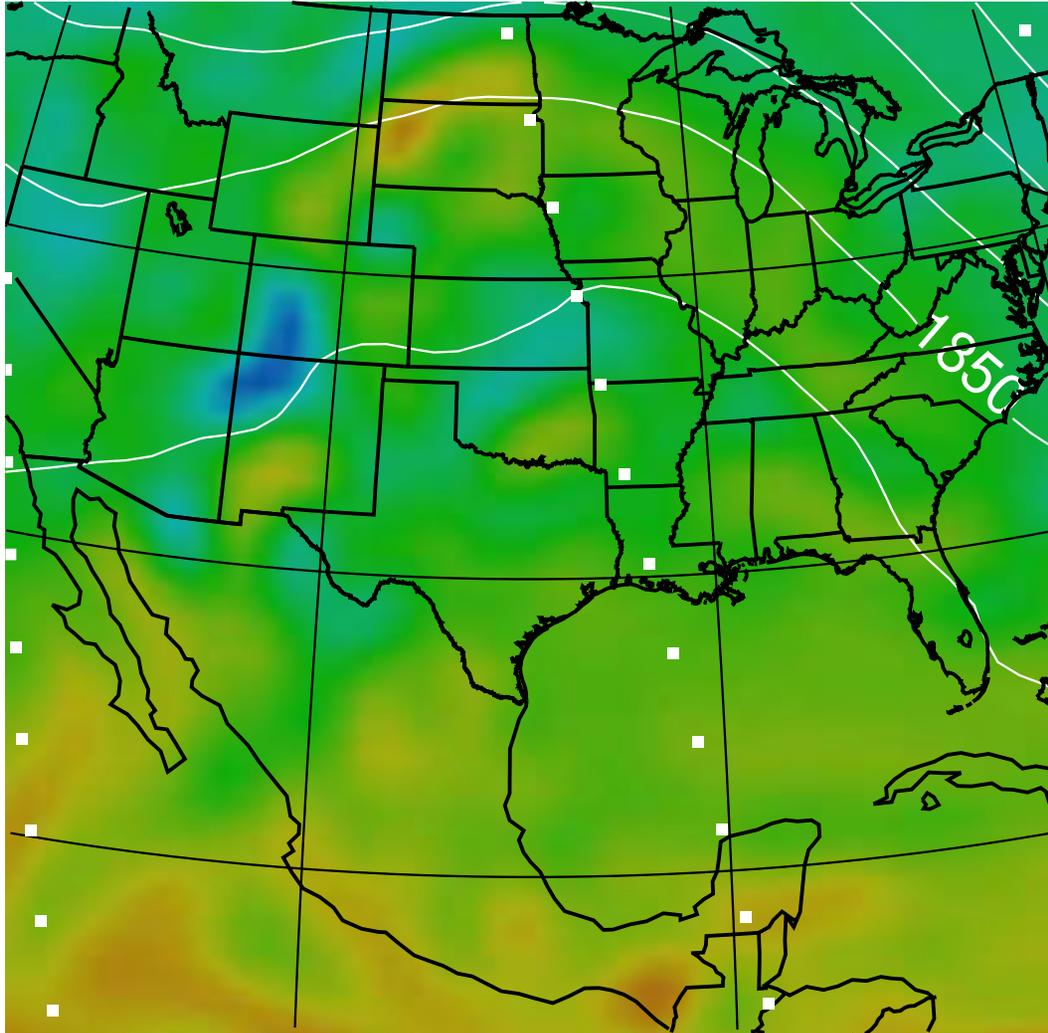
Z (dam)

Ascent (6 mb/hr)

Descent (6 mb/hr)

T (K)

18 UTC on 29 October, 2004 at 70.0 mb

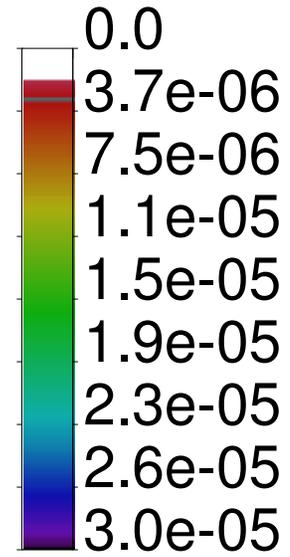


NMC, Grid: GG1X1

Seq: E01, Spec: SAVN170L42

18 hr fcst

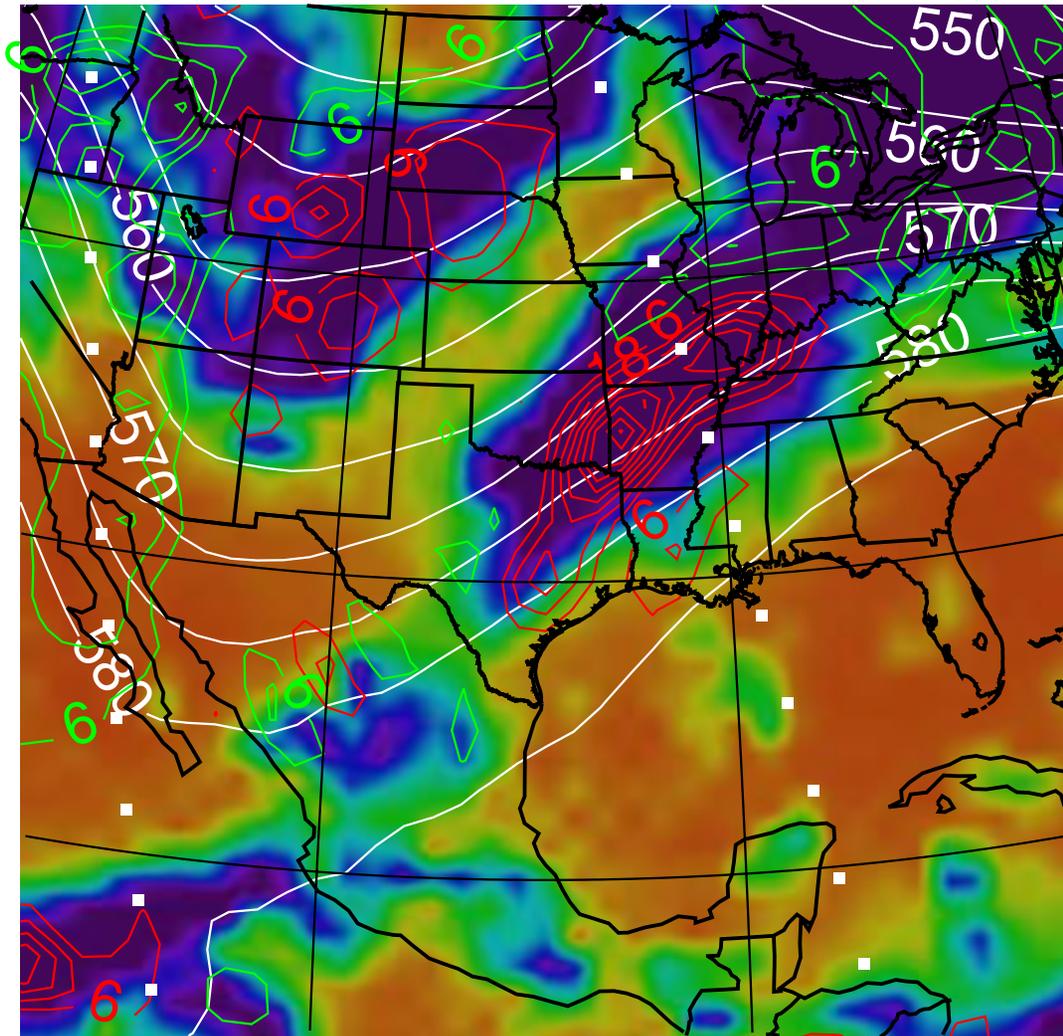
EPV at 70 MB ($\text{K m}^2/\text{kg s}$)



Z (dam)

Trop (EPV=2.5)

00 UTC on 1 November, 2004 at 500.0 mb

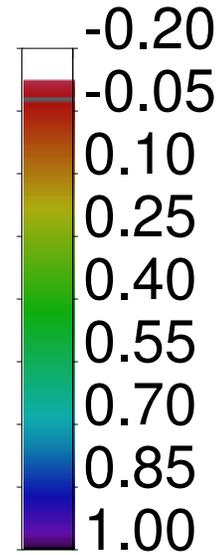


NMC, Grid: GG1X1

Seq: E01, Spec: SAVN170L42

72 hr fcst

Total CF ()



Z (dam)

Ascent (6 mb/hr)

Descent (6 mb/hr)

Trop (EPV=2.5)

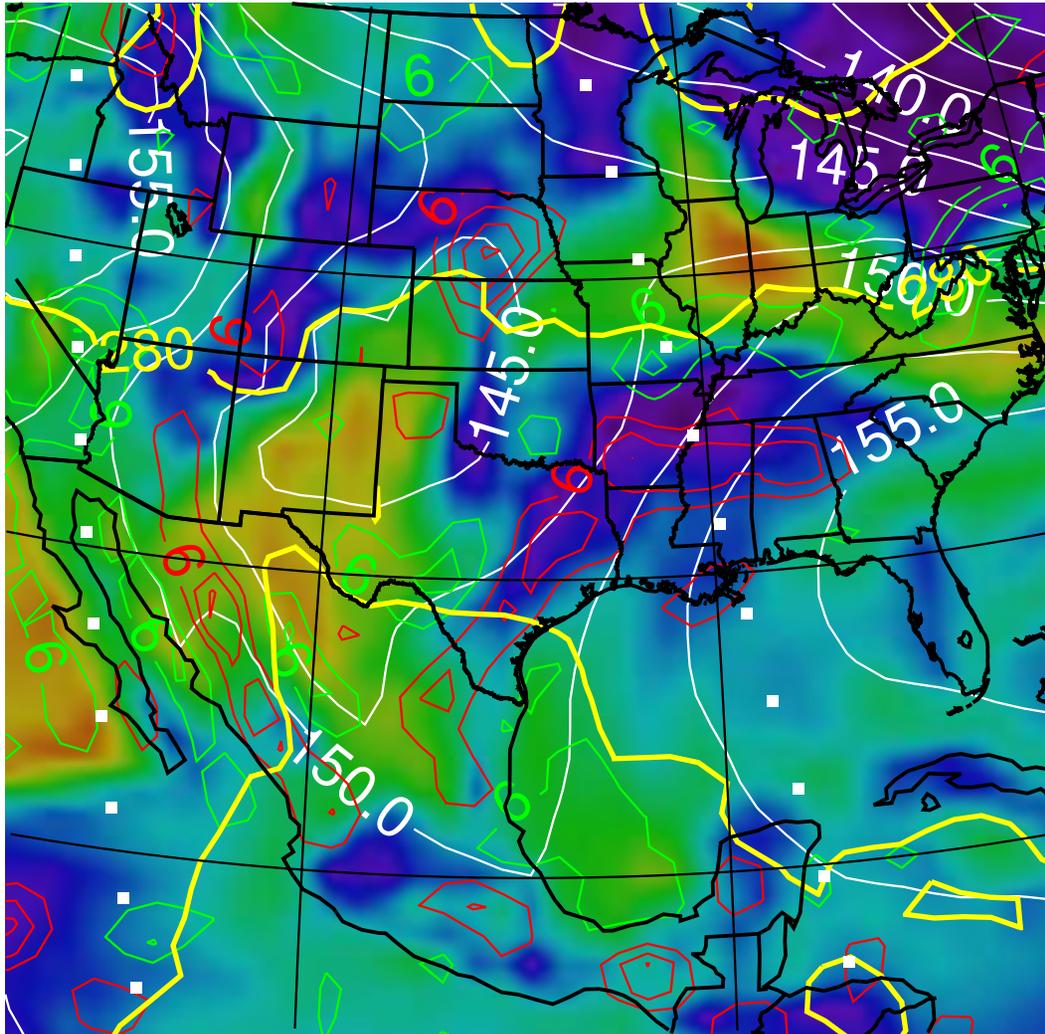
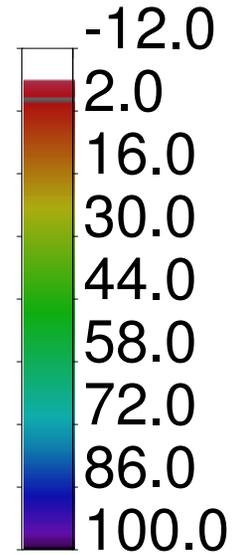
00 UTC on 1 November, 2004 at 850.0 mb

NMC, Grid: GG1X1

Seq: E01, Spec: SAVN170L42

72 hr fcast

RH at 850 MB (%)



Z (dam)

Ascent (6 mb/hr)

Descent (6 mb/hr)

T (K)