

Unit 21 ATM401/ATM601/Chem601

1. All students: At a site, average temperature and geostrophic wind before and after passage of a front are 8°C , 10m/s and 5°C , 7m/s , respectively. Calculate the slope of the front. What assumption do you make and why? What type of front is it?
2. All students: Assume a strong surface pressure gradient on the large-scale might consist of a high at 1025hPa separated by 800km from a 995hPa low. Determine the air pressure gradient and compare it with the pressure gradient between the core of a tornado and the area just outside its funnel differs about 100hPa on a distance of about 500m . What assumption did you make to solve the problem? Identify the reasons for your assumptions? How much greater is the pressure gradient of the tornado? One of the reasons why strong tornadoes are so destructive is that their power, P , increases as the cube of their wind speed, v , according to $P = kv^3$ where k is a constant. An F4 tornado has wind speeds of $92.5 - 116.4\text{m/s}$, while wind speeds range from $32.2 - 50\text{m/s}$ for an F1 tornado. What type of tornado is this? How much faster are the wind speeds of the tornado than the wind speed between our high and low pressure system?? How much higher is the power of an F4 tornado compared to an F1 tornado?