Copy of Colab_Kinematics_python_function.ipynb ☆

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What are the **units and typical magnitude in the atmosphere** of these horizontal kinematic quantities (divergence, vorticity, deformation)?

To answer this, suppose u,v are in m/s (-10 to 10 range of values), and x,y are in 100s of km (so the *quiver* plots are about 2000 km across). You can just estimate the order of magnitude of anoy one of the derivatives (or a coefficient c_1, c_2, c_3, c_4). Express your answer using seconds as the time unit, and then convert to days as the time unit. (You may take $1day \simeq 10^5 s$ for convenience)

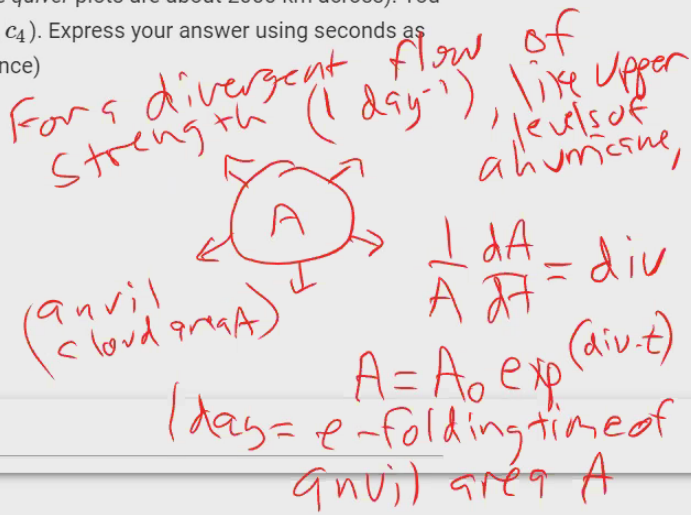
Answer 3:

Typical values of the top and bottom of one of these kinematic derivative components are:

$\delta u \simeq 10 m/s$

$\delta x \simeq 1000 km$

Therefore, the typical value $\delta u / \delta x$ is .00001 s^{-1} or 1 day^{-1}.



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Exercise 4: Pure vor, plus U of various strengths

Notice that this is like looking at different altitudes, in a flow made up of a cyclone (same at all levels) plus more and more of a westerly wind increasing with height, like in midlatitudes because of the north-south temperature (thickness) gradient. In your description, try to describe the flows in the ways we describe weather systems in the atmosphere (closed highs and lows, or troughs and ridges).

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[ ]  # Define the display field udisp,vdisp and give it a label.
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