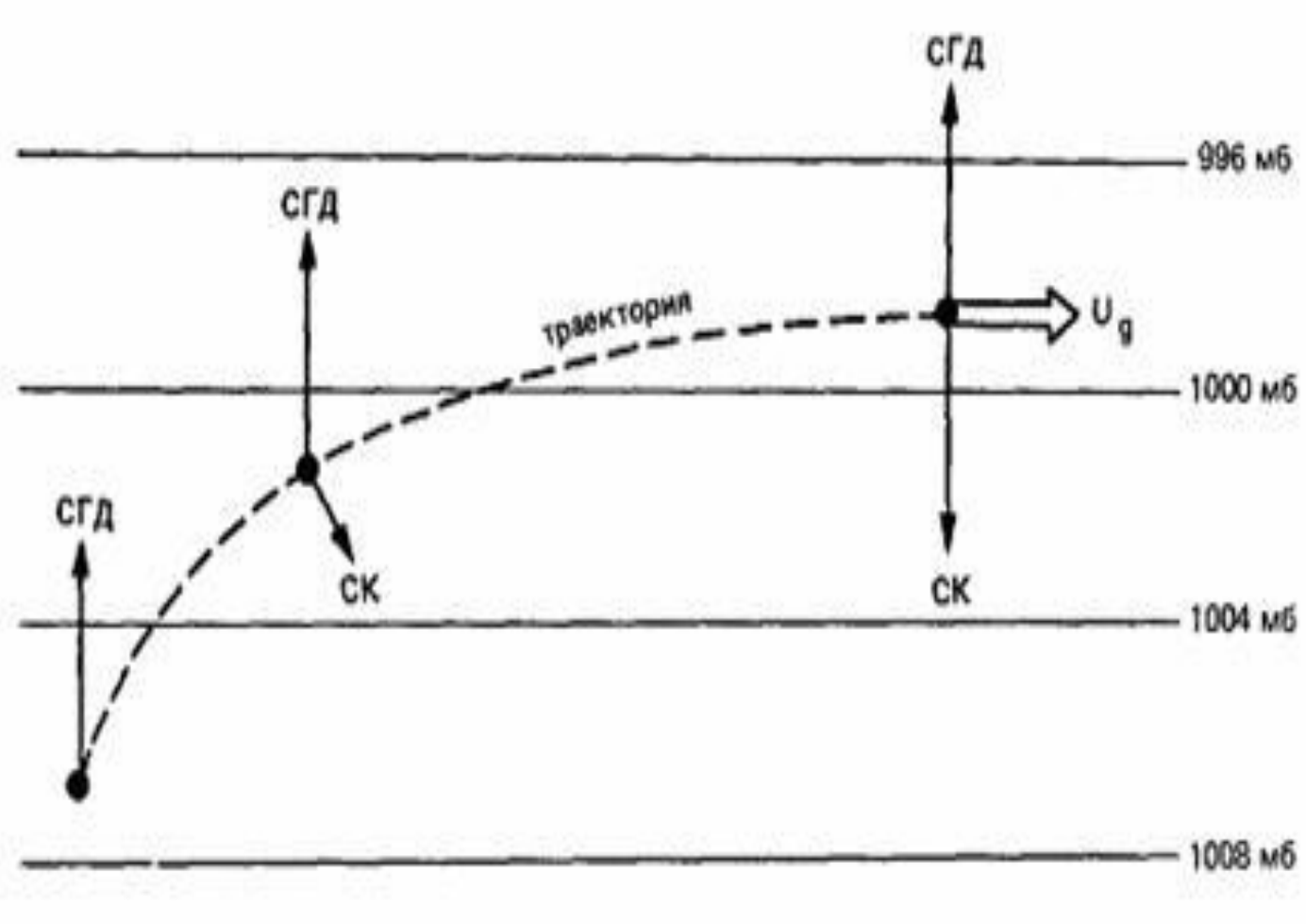
Швидкість вітру у вільній атмосфері

Виконав студент II курсу Жігінас Д.В.
Науковий керівник доцент Затула В.І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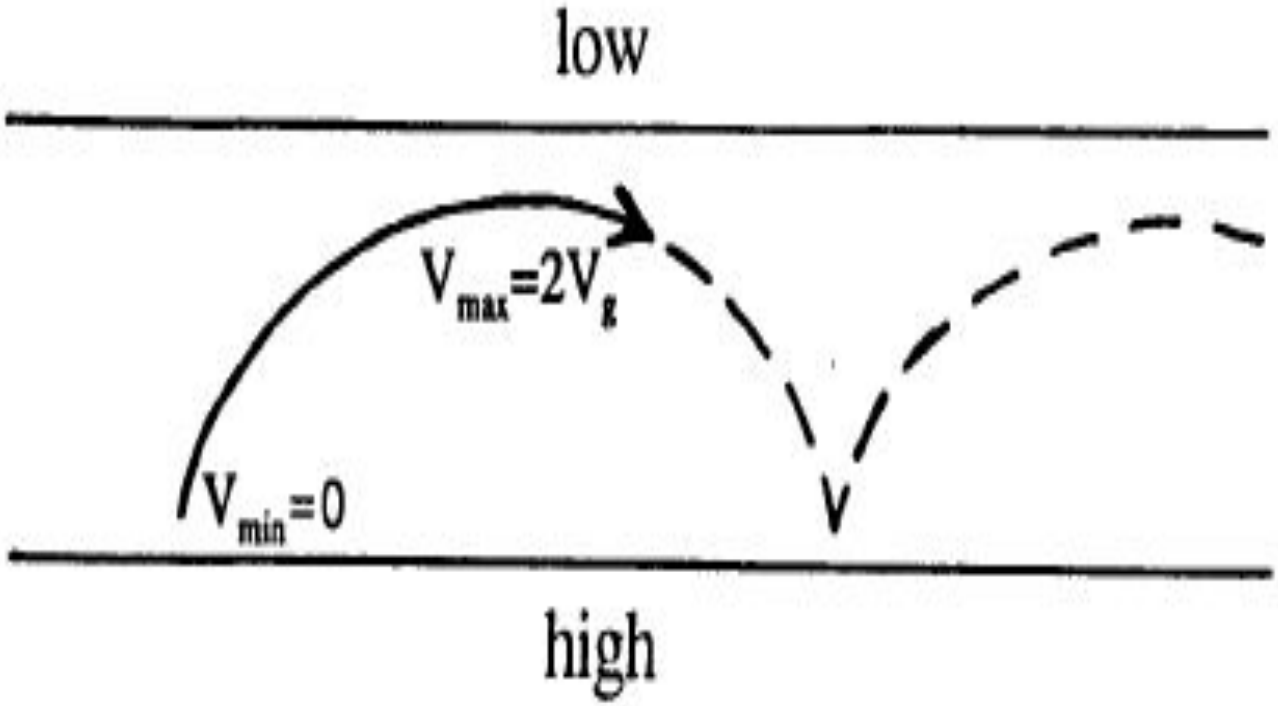

Fig. 7 When an air parcel from rest enters a pressure gradient that is not changing with time it will follow a normal cycloid

Persson, A. (2002) The Coriolis force and the nocturnal jet stream (Coriolis part 7). Weather, 57, pp 28-33

$$\begin{cases} \dfrac{du}{dt} - fv = 0 \\ \dfrac{dv}{dt} + fu = -\dfrac{\partial p}{\rho \partial y} \end{cases}$$

$$v = \frac{du}{dt} * \frac{1}{f}$$

$$\frac{dv}{dt} = \frac{d^2u}{dt^2} * \frac{1}{f}$$

$$\frac{d^2u}{dt^2} * \frac{1}{f} + fu + \frac{\partial p}{\rho \partial y} = 0$$

$$\frac{d^2u}{dt^2} + f^2u + \frac{f}{\rho} * \frac{\partial p}{\partial y} = 0$$

$$u = Asinft + Bcosft + C$$

$$\frac{du}{dt} = Afcosft - Bfsinft$$

$$\frac{d^2u}{dt^2} = Af^2(-sinft) + Bf^2(-cosft)$$

$$u_g = -\frac{1}{\rho f} * \frac{\partial p}{\partial y}$$

$$\begin{cases} u = u_g(1 - cosft) \\ v = u_g sinft \end{cases}$$

$$u_g = -\frac{1}{\rho f} * \frac{\partial p}{\partial y}$$

$$v_g = \frac{1}{\rho f} * \frac{\partial p}{\partial x}$$

$$\begin{cases} u = (u_0 - u_g)cosft + (v_0 - v_g)sinft + u_g \\ v = (v_0 - v_g)cosft + (u_g - u_0)sinft + v_0 \end{cases}$$