
Subject: Re: Calculating streamfunction from wind components
Posted by [Kenneth Bowman](#) on Fri, 10 May 2013 16:32:34 GMT
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On 2013-05-09 20:40:32 +0000, james.rachelanne@googlemail.com said:

> Hi Liam,
>
> I'm looking to do something similar. Did you ever find anything useful?
>
> Cheers,
>
> Rachel

Is the flow 2-D and incompressible so that

$$u = -d\psi/dy$$

and

$$v = d(\psi)/dx ?$$

Depending on your boundary conditions, you may be able to integrate across the domain in one direction or the other to get a streamfunction.

Otherwise you have to solve the elliptic problem for ψ . There is a table of cases (2-D, 3-D, irrotational, etc.) in Dutton's book on atmospheric dynamics.

You can calculate streamlines (which are equivalent to the streamfunction in special cases) using a trajectory model (which is, in general, a non-trivial undertaking).

Ken Bowman
