ID de Contribution: **1** Type: **Non spécifié**

The primitive equations of the ocean and the atmosphere

mercredi 21 mai 2025 11:45 (30 minutes)

With the aim of predicting meteorological phenomena, in 1922 the mathematician and meteorologist Richardson proposed and used a simplified version of the Navier-Stokes equations: the primitive atmospheric equations. These equations proved to be a good model for studying large-scale flows where the vertical component of motion is, in this case, much weaker than the horizontal component. Bryan then applied them to oceanographic models (1969), noting that the ocean layer on Earth is very thin compared with the planet's dimensions.

In this purely introductory presentation, we are going to show the physical origin of this model and justify the mathematical study that I carried out in one of my thesis works.

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