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Title: *Linear algebra in numerical weather prediction*

Abstract: Before the advent of computers, weather forecasts were made by hand drawn maps and relied heavily on the forecasts' collective experience. trying to forecast the weather by solving the governing equations of our atmosphere by hand was a mammoth task that had no application in day to day forecasting. This is in sharp contrast to today, where any forecaster can obtain output from powerful models, updated multiple times a day, with the click of a button. While these models owe their existence to partial differential equations and their approximating difference equations, linear algebra techniques greatly improve the models. With these techniques, the models not only put the initializing data to better use, but they also solve the governing equations more efficiently. This higher efficiency frees computing power for other uses, such as running the model with higher temporal or spacial resolution or just running the model more often. We will take a brief look at the history of numerical weather prediction and examine the applications and benefits of linear algebra in these models.