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As a reminder, the purposes of these updates are twofold. The first is provide information on the progress of MAGIC (note the new logo!), and the second is to disseminate information on associated topics that might be of interest to those who are not atmospheric scientists or meteorologists but wish to gain an appreciation and understanding of these fields. All of the updates and other information on MAGIC can be found at the website listed below. Please contact me if you do not wish to receive these postings, or if you know anyone who does wish to receive them.

This week's update will continue with clouds and cloud formation by providing two examples of clouds from everyday life. The first can be seen in the exhaust exiting the tailpipe of an automobile on a cold day. This cloud is formed by the same basic process described last week. This exhaust derives from combustion of gasoline. Combustion, or burning, means to combine with oxygen. Gasoline is composed of hydrocarbons ("hydro" meaning water and "carbon" meaning carbon) such as octane (C_8H_{18}). The result of this combustion is mostly of water vapor and carbon dioxide (two molecules of octane combine with 25 molecules of oxygen to produce 16 molecules of carbon dioxide and 18 molecules of water vapor; or $2C_8H_{18} + 25O_2 = 16CO_2 + 18H_2O$ for the chemistry-oriented among you). The exhaust is hot when it leaves the tailpipe but rapidly cools when it is encounters the colder outside air. This cooling results in the relative humidity reaching 100%, and the water vapor then condenses on aerosol particles, which may be those resulting from incomplete combustion or those already in the atmosphere from other sources, to form cloud drops.

A cloud also forms in the neck of a bottle of beer when it is opened. This is eloquently described in the book "Clouds in a Glass of Beer," by Craig Bohren (which I recommend to anyone who has an interest in atmospheric phenomena). When the bottle, which is under pressure, is opened, the gas in the neck of the bottle (above the beer) rapidly expands and in doing so cools. During this cooling, the relative humidity of that gas attains values much greater than 100%, forming a small, white wispy cloud that is visible for a very short while, until the air warms up and the drops evaporate. The process by which the individual cloud drops form in this type of cloud is different from that in the other clouds discussed; this is described in the book for those interested.

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Please address any questions or comments to elewis@bnl.gov.

All updates and other MAGIC information can be found at <http://www.ecd.bnl.gov/MAGIC.html>.