

## Cloud microphysics - Exercises 2

1. Cloud seeding with water droplets
  - (a) If 40 liters of water in the form of drops of 0.5 mm diameter was poured into the top of a cumulus cloud and all of the drops grew to a diameter of 5 mm before they emerged from the base of the cloud, which has an area of 10 km<sup>2</sup>, what would be the amount of rainfall induced?
  - (b) What is the increase in the mass of the droplets?
  - (c) Compare the increase in the mass with that of a droplet of 20 μm radius that is introduced at the cloud base, travels upward, then downward, and finally emerges from the cloud base with a diameter of 5 mm.
  - (d) Which cloud seeding method is more efficient according to the results of this exercise? Is any of the methods promising?
2. Calculate the relative humidity of the air adjacent to a pure water droplet 0.2 μm in radius if the temperature is 0°C. (The surface energy of water at 0°C is 0.076 Jm<sup>-2</sup> and the number density of molecules in water at 0°C is 3.3·10<sup>28</sup>m<sup>-3</sup>).