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12.085 Seminar in Environmental Science  
Spring 2008

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Week 3: Teller et al, 1997

The paper “Global Warming and Ice Ages: Prospects for Physics-Based Modulation of Global Climate Change” submitted for the 22<sup>nd</sup> International Seminar on Planetary Emergencies in 1997 discusses some interesting ideas for managing or preventing changes in climate. All methods discussed are methods to prevent ~1% of incoming solar radiation by scattering materials placed either in the stratosphere or space. This is a different approach to the problem of global warming which most take, rather than dealing with the cause of the problem, they instead look at counteracting the effects. They cover several different methods of scattering light including injecting sulfate or possibly alumina aerosols into the stratosphere, dispersal of electrically conducting sheets either in the form of ultra thin sheets, mesh nets or tiny metallic walled balloons into either the stratosphere or low earth orbit, and emplacement of quasi-resonant scatterers made of carbon caged alkali atoms or organic dyes into the stratosphere. They concluded that these methods are well worth researching, and that they cost significantly less and would be more politically feasible than large scale reduction in greenhouse gas emissions as a method for counteracting the current climate crisis.

One of the methods I thought was most interesting was the prospect of the aluminum balloons placed in the stratosphere. Teller et al think it is practical because from a certain altitude they are self deploying and operating. They also claim that there is little to no environmental impact because the earth’s crust is so aluminum rich, and the aluminum would readily weather in the troposphere on the way down, the ballons

essentially turn to powder and fall to earth without notice or large environmental changes.

I think what interested me most about this proposal was the detail in which they described the possibility of manufacturing these particles by using modified news paper printing presses.

My major questions having read the article, which do not seem to be adequately addressed are about the other effects of reducing the incident light by 1%. Would it have a noticeable effect on agriculture or plant growth, or just to humans outside on a daily basis? What about weather patterns and local climate? They briefly touch upon the possibility of modifying the climate latitudinally, but they do not give any time to what this might do to the weather patterns and other effects, and who would get to decide how the climate was modified. My limited understanding of climate and weather leads me to believe that the pattern of incoming radiation drives the weather systems.