

Aerosol Particles and Their Role in the Atmospheric Radiation Balance

Atul Kumar Pandey¹, Vishalakshi Singh², Dinesh Kumar*³, Pushpender Kumar Gangwar⁴,
Rajesh Kumar Verma⁵

Assistant Professor, Department of Physics^{1,2,3,4,5}

Government Degree College, Sehmo Basti, Uttar Pradesh, India¹

D. D. U. Government P. G. College Saidabad Prayagraj, Uttar Pradesh, India²

Government P.G. College Fatehabad Agra³

Bareilly College, Bareilly, Uttar Pradesh, India⁴

K. S. Saket PG College Ayodhya, Uttar Pradesh, India⁵

atulkumarpandey78@gmail.com, singhvishalakshi15@gmail.com,

*Correspondence : rajpootdr12@gmail.com, dr.pkgangwar@gmail.com, iitr.rajesh@gmail.com

Abstract: *Aerosol particles in the atmosphere have a big impact on the Earth's energy budget, because they can scatter and absorb solar energy (solar radiation) and heat energy from the Earth (terrestrial radiation). Also, they affect the climate indirectly by their interaction with clouds. Both of these factors lead to uncertainty about how much the aerosol particles contribute to human-caused climate change. Research on this topic has been going on for decades. To create a summary of what we currently know about aerosol optical properties, direct and indirect radiative effects due to aerosol particle characteristics, primary sources of aerosols, and regional variations across the globe. Overall, this review shows aerosol particles contribute to a cooling effect (aero-refraction) from the total radiative forcing of aerosol particles (against the greenhouse gases they have). This cooling effect cancels out a large portion of the greenhouse gases, although we still do not know very much about the indirect effect of clouds on aerosol particles (Boucher et al 2013).*

Keywords: aerosols, radiative forcing, radiation balance, direct effect, indirect effect, climate forcing, optical properties