

# The Umov effect in dust aggregates

Himadri S. Das<sup>1,\*</sup>, and Ayesha M. Mazarbhuiya<sup>1</sup>

<sup>1</sup> Department of Physics, Assam University, Silchar 788011, India

\* Presenting author (hsdas13@gmail.com)

The *Umov effect* [1] is an inverse correlation between the reflectivity (or geometric albedo) of an object and the degree of linear polarization of light scattered by it. In this work, three different types of fractal aggregates (BA, BAM1, and BAM2) having the same characteristic radius and varying porosity are considered to study the effect of porosity on geometric albedo ( $A$ ) and the maximum value of the positive polarization ( $P_{max}$ ). The porosity of Ballistic Aggregates (BA), Ballistic Agglomeration with one migration (BAM1) and Ballistic Agglomeration with two migration (BAM2) is taken to be 0.87, 0.74, and 0.64, respectively. Using the T-matrix light scattering code,  $P_{max}$  and  $A$  are calculated for three different aggregated structures with silicate and organic composition. A systematic study is made in this work to visualize the Umov effect. The present study shows that the porosity of the aggregates plays a major role in the  $P_{max}$  versus  $A$  diagram.

## References:

[1] Umov, N. A., 1905: Chromatische depolarisation durch lichtzerstreuung. Phis. Zeits. 6, 674–676.