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Small angle scattering study of the structure and organization of RNA and protein in Brome Mosaic Virus (BMV)[1] NARAYAN C. DAS, Center for the Exploration of Energy and Matter, GARFIELD T. WARREN, SI CHENG, Department of Physics, C. CHENG KAO, PENG NI, Department of Molecular and Cellular Biochemistry, BOGDAN DRAGNEA, Department of Chemistry, PAUL E. SOKOL, Center for the Exploration of Energy and Matter & Department of Physics, Indiana University — Brome mosaic virus (BMV) is a small icosahedral of the alpha virus-like superfamily of RNA with a segmented positive-strand RNA genome and a mean diameter $\sim$ 268Å that offers high levels of RNA synthesis and virus production in plants. BMV also tightly regulates the packaging of its four RNAs (RNA1 through RNA4) into three separate particles; RNA1 and RNA2 are encapsidated separately while one copy each of RNA3 and RNA4 are normally packaged together. Small angle neutron scattering (SANS) and small angle X-ray scattering (SAXS) were applied to study the size, shape and protein-RNA organization of BMV. D_2O/H_2O mixture was used to enhance contrast in SANS measurement. The radial distribution of BMV from the Fourier transform of scattering spectrum gives a clear indication of RNA packing, and distribution and their structure in the BMV. The result reveals that the virus is about 266 Å in diameter and is composed of RNA inside the virion coated with a protein shell.

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Narayan C. Das
Center for the Exploration of Energy and Matter, Indiana University

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