### Presentation: POSTER

# Title: Two-dimensional Pattern Reverse Monte Carlo Method for Modeling the Structures of Nano-paritcles in Uni-axial Elongated Rubbers

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## Abstract:

Recently, Shinohara et al. have observed the four spots patterns due to 100nm-size particles in the uni-axially elongated rubbers by the time-resolved two-dimensional Ultra Small Angle X-ray Scattering method[1]. They found the four spots patterns change corresponding to the elongation ratio. We develop the two-dimensional pattern Reverse Monte Carlo (2D pattern RMC) method for the uni-axial systems in order to make the model of structures from the two-dimensional structure factors[2]. Here, the two-dimensional structure factor stands for the projection of three-dimensional structure factor into qz=0 in the Ewald sphere. This kind of analysis needs huge requirements of computational resources and theoretical treatment for the two-dimensional structure factors of the uni-axial systems.

We present the computing formulation of the 2D pattern RMC method for the uni-axial systems and the preliminary results of the 2D pattern RMC analysis of the two-dimensional structure factors due to silica particles in a uni-axially elongated polybutadiene rubber. The programming source are coded using MPI (Massage Passing Interface).

#### References

- Y. Shinohara, H. Kishimoto and Y. Amemiya, SPring-8 Research Frontiers 2004 (2005) 88-89.
- [2] K. Hagita, H. Okamoto, T. Arai, H. Kishimoto, N. Umesaki, Y. Shinohara and Y. Amemiya, AIP Conference Proceedings 832 (2006) 368-371.