Summary of Research Plan

Research of finite type invariants for virtual links

The virtual link can be regarded an extension of link, which makes it possible to study links consistently. Goussarov-Polyak-Viro defined a finite type invariant for virtual links as one for links. On the other hand, Goussarov and Habiro gave a topological interpretation of finite type invariants by local moves. We want to expand the local move theory to virtual links and give a topological interpretation of finite type invariant for virtual links. Furthermore by elucidating algebraic and combinatorial properties of the extended local moves, we want to clarify the structure of finite type invariant for virtual links and give new properties of them. As a corollary, we want to give new properties of finite type invariant for links.

Classification of handlebody-links under link-homotopy

By joint working with Atsuhiko Mizusawa, we gave a one to one correspondence between link-homotopy classes of some handlebody-links and the quotient space of tensor product space by the action of general linear group. On the other hand, in general elements in the quotient space can not be compared. Therefore, we consider an algorithm for comparison. We want to improve our invariant more strongly. Then, we want to classify general handlebody-links completely.