Plans of my reserch (Teruhisa Kadokami)

1. I would like to prove the additivity of the 3-dimensional clasp numbers for knots in S^3. This problem would be a basic fact to show the additivity problem of the unknotting numbers. To study properties of clasp disks is needed to solve the problem.

2. I would like to determine the 3-diemnsional clasp number of any two bridge knot. I obtained a upper bound for it and conjectured its equality. I confirmed the equality for a certain class.

3. Since a flat virtual link corresponds to a set of fillable curves (cf. I. Kra) on a closed surface, the theory of flat virtual links is appliable to both 2-dimensional hyperbolic geometry and Teichmüller space theory.

4. I would like to make tables of prime virtual/flat virtual links, characterize them theoretically, and study effects of invariants under connected sums.

5. A virtual link can be realized as a link in a product space of a closed surface and the closed interval. From the fact, by deforming a link in a general compact 3-manifold with a Heegaard splitting into a regular neiborhood of the Heegaard surface, the link may be described as a virtual link with certain additonal structures. I would like to make this kind theory.

6. I would like to study relationships between the theory of flat virtual links and that of nanowords defined by V. Turaev from geometric points of view.

7. I would like to study the meaning of difference between the ordinary Arf invariant (for proper links) and a new one (for algebraically split links) defined in "Proper link, algebraically split link and Arf invariant".

8. I showed fundamental moves of n-component C-complexes in "Component-isotopy of Seifert complexes". I would like to study fundamental moves of R-complexes in the similar way, solve a problem about fundamental moves of ribbon disks due to Y. Marumoto and Y. Nakanishi, and study the slice-ribbon conjecture by using researchs above.

9. I would like to study more about exceptional surgeries by using the Reidemeister torsions. I have obtained many algebraic techniques for the case that Dehn surgeries along knots. So I would like to study the case of links, in particular, 2-component links, and deal with not only abelian torsions but also non-abelian torsions.

10. Through the Reidemeister torsions, we observed about relationships between Dehn surgeries and branched coverings. From the fact, I would like to compute the Casson-Walker invariants and study geometric properties.

11. I would like to study more about relationships between Knot Theory and Number Theory.

12. I would like to define the 4-genus of links appropriately and apply to estimate the C_k-unknotting numbers.

13. I would like to study more about the MQ indices.