

1135-AD-1056      **Kanako Oshiro\*** ([oshirok@sophia.ac.jp](mailto:oshirok@sophia.ac.jp)). *G-families of quandles, their homology theory and cocycle invariants of handlebody-knots.*

This talk is based on the paper "A. Ishii, M. Iwakiri, Y. Jang and K. Oshiro, A G-family of quandles and handlebody-knots, Illinois J. Math. 57 (2013), no. 3, 817–838". G-families of quandles are used to produce invariants of handlebody-knots. As in the case of quandles, we can construct their (co)homology theory and as an application, we have cocycle invariants for handlebody-knots. I would also like to show the Nosaka's method to construct cocycles of a given  $G$ -family of quandles. I remark that any invariant of handlebody-knots is also useful as that of classical-knots. (Received September 19, 2017)