Lie Groups and Representation Theory Seminar at the University of Tokyo

リー群論・表現論セミナー

SPEAKER   **Ronald King** (the University of Southampton)

DATE   November 11 (Mon), 2013, 16:30–17:30

PLACE   Room 126, Graduate School of Mathematical Sciences

TITLE   Alternating sign matrices, primed shifted tableaux and Tokuyama factorisation theorems

ABSTRACT   Twenty years ago Okada established a remarkable set of identities relating weighted sums over half-turn alternating sign matrices (ASMs) to products taking the form of deformations of Weyl denominator formulae for Lie algebras B_n, C_n and D_n. Shortly afterwards Simpson added another such identity to the list. It will be shown that various classes of ASMs are in bijective correspondence with certain sets of shifted tableaux, and that statistics on these ASMs may be expressed in terms of the entries in corresponding compass point matrices (CPMs). This then enables the Okada and Simpson identities to be expressed in terms of weighted sums over primed shifted tableaux. This offers the possibility of extending each of these identities, that originally involved a single parameter and a single shifted tableau shape, to more general identities involving both sequences of parameters and shapes specified by arbitrary partitions. It is conjectured that in each case an appropriate multi-parameter weighted sum can be expressed as a product of a deformed Weyl denominator and group character of the type first proved in the A_n case by Tokuyma in 1988. The conjectured forms of the generalised Okada and Simpson identities will be given explicitly, along with an account of recent progress made in collaboration with Angèle Hamel in proving some of them.