1086-33-394 **Ryu Sasaki*** (ryu@yukawa.kyoto-u.ac.jp), Kitashirakawa Oiwakecho, Sakyo-ku, Kyoto, 606-8502, Japan. *Multi-indexed q-Racah and Askey-Wilson polynomials.*

Multi-indexed orthogonal polynomials satisfy second order differential (difference) equations. They start at degree $\ell \geq 1$ and form a complete set of orthogonal functions. They are obtained by deforming the classical orthogonal polynomials (e.g. Jacobi, q-Racah, Askey-Wilson etc) in terms of multiple Darboux-Crum transformations and their difference analogues [1,2,3]. In the case of Jacobi, they form global solutions of Fuchsian differential equations having $3+\ell$ regular singularities [1]. Multi-indexed q-Racah and Racah polynomials and their reductions provide ample examples of exactly solvable birth and death processes [4].

[1] S. Odake and R. Sasaki, "Exactly solvable quantum mechanics and infinite families of multi-indexed orthogonal polynomials," Phys. Lett. B **702** (2011) 164-170, arXiv:1105.0508[math-ph].

[2] S. Odake and R. Sasaki, "Multi-indexed (q-)racah polynomials, J. Phys. A **45** (2012) in press, arXiv:1203.5868[math-ph].

[3] S. Odake and R. Sasaki, "Multi-indexed Wilson and Askey-Wilson Polynomials," arXiv:1207.5584[math-ph].

[4] R. Sasaki, "Exactly Solvable Birth and Death Processes," J. Math. Phys. bf 50 (2009) 103509 (18 pp), arXiv:0903.3097[math-ph]. (Received August 29, 2012)