1053-05-207　　　　　　**Domenico Senato*** (`domenico.senato@unibas.it`), Viale dell'Ateneo Lucano 10, 85100 Potenza, Italy, and **Elvira Di Nardo**, Viale dell'Ateneo Lucano 10, 85100 Potenza, Italy.
Computations of classical, boolean and free cumulants via Abel polynomials.

We provide an unifying polynomial expression giving moments in terms of cumulants, and viceversa, holding in the classical, boolean and free setting. This is realized by using a suitable representation of Abel polynomials, relied on the classical umbral calculus, a symbolic language introduced by Rota and Taylor in "The classical umbral calculus", SIAM J. Math. Anal. 25 (1994), 694-711. Moreover via these generalized Abel polynomials, we construct a new class of cumulants, including the classical, boolean and free ones, and the convolutions linearized by them. We give a simple and computationally efficient algorithm for conversion formulae between moments and cumulants. The algorithm provides just one formula for all kind of cumulants and it is particularly suited to be implemented by using software for symbolic computations, as for example MAPLE. Comparisons with existing procedures, especially for conversions between moments and free cumulants, show the efficiency of the proposed approach. (Received September 04, 2009)