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Catherine Yan* (cyan@math.tamu.edu), Department of Mathematics, Texas A&M University, MS 3368, College Station, TX 77843-3368, and **William Chen** (chen@nankai.edu.cn), **Svetlana Poznanovik** (svetlana@math.gatech.edu) and **Arthur Yang** (yang@nankai.edu.cn). *Major Index for 01-Fillings of Moon Polyominoes.*

We show how to generalize Foata's second fundamental transformation on permutations to a family of 01-fillings of polyominoes, and use it to extend MacMahon's equi-distribution result of inv and maj to 01-fillings of moon polyominoes. (Received September 19, 2011)