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Promotion and rowmotion. (English. French summary) [Zbl 1417.06003](#)

Proceedings of the 24th international conference on formal power series and algebraic combinatorics, FPSAC 2012, Nagoya, Japan, July 30–August 3, 2012. Nancy: The Association. Discrete Mathematics & Theoretical Computer Science (DMTCS). Discrete Math. Theor. Comput. Sci., Proc., 271-283 (2012).

Summary: We present an equivariant bijection between two actions – promotion and rowmotion – on order ideals in certain posets. This bijection simultaneously generalizes a result of *R. P. Stanley* [Electron. J. Comb. 16, No. 2, Research Paper R9, 24 p. (2009; [Zbl 1169.06002](#))] concerning promotion on the linear extensions of two disjoint chains and certain cases of recent work of [*D. Armstrong, C. Stump* and *H. Thomas*, “A uniform bijection between noncrossing and nonnesting partitions”, Preprint, [arXiv:math.CO/1101.1277](#)] on noncrossing and nonnesting partitions. We apply this bijection to several classes of posets, obtaining equivariant bijections to various known objects under rotation. We extend the same idea to give an equivariant bijection between alternating sign matrices under rowmotion and under *B. Wieland*’s gyration [Electron. J. Comb. 7, No. 1, Research paper R37, 13 p. (2000; [Zbl 0956.05015](#))]. Lastly, we define two actions with related orders on alternating sign matrices and totally symmetric self-complementary plane partitions.

For the entire collection see [[Zbl 1257.05001](#)].

MSC:

- [06A07](#) Combinatorics of partially ordered sets
- [05A19](#) Combinatorial identities, bijective combinatorics
- [05B20](#) Combinatorial aspects of matrices (incidence, Hadamard, etc.)

Cited in 1 Document

Keywords:

poset; order ideal; noncrossing; promotion; equivariant; alternating sign matrices

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