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**Amanda Welch\*** ([welcha1@vt.edu](mailto:welcha1@vt.edu)). *Double Affine Bruhat Order*. Preliminary report.

Given a finite Weyl group  $W_{\text{fin}}$  with root system  $\Phi_{\text{fin}}$ , one can create the affine Weyl group  $W_{\text{aff}}$  by taking the semidirect product of the translation group associated to  $Q^\vee$ , the coroot lattice for  $\Phi_{\text{fin}}$ , with  $W_{\text{fin}}$ . The double affine Weyl semigroup  $W$  can be created by using a similar semidirect product where one replaces  $W_{\text{fin}}$  with  $W_{\text{aff}}$  and  $Q^\vee$  with the Tits cone of  $W_{\text{aff}}$ . We classify cocovers and covers of a given element of  $W$  with respect to the Bruhat order, specifically when  $W$  is associated to a finite root system that is irreducible and simply laced. We show two approaches: one adapting the work of Lam and Shimozono, and its strengthening by Milićević, where cocovers are characterized in the affine case using the quantum Bruhat graph of  $W_{\text{fin}}$ , and another, which takes a more geometrical approach by using the length difference set defined by Muthiah and Orr. (Received September 21, 2018)