1154-05-751 **Neal Madras*** (madras@mathstat.yorku.ca), Dept of Mathematics & Statistics, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3, Canada, and **Justin M. Troyka** (jmtroyka@yorku.ca), Dept of Mathematics & Statistics, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3, Canada. *Periodic Pattern-Avoiding Permutations.* Preliminary report.

To gain insight into the structure of pattern-avoiding permutations, and motivated by the idea of periodic boundary conditions in physics, we propose a new "boundedness" condition for affine permutations. An *affine permutation of period* N is a bijection ω of $\mathbb{Z}$ satisfying

$$\omega(i+N) = \omega(i) + N \quad \forall i \in \mathbb{Z}$$

as well as the centering condition

$$\sum_{i=1}^{N} \omega(i) = \sum_{i=1}^{N} i\,,$$

and we say it is *bounded* if

$$|\omega(i) - i| < N \quad \forall i \in \mathbb{Z}.$$

Let BA_N be the set of bounded affine permutations of period N. Note that for any (ordinary) permutation σ on $\{1, \ldots, N\}$, the periodic extension of σ via $\sigma(i+kN) = \sigma(i) + kN$ ($k \in \mathbb{Z}$) is in BA_N.

For a fixed short permutation τ, let $\mathsf{AvBA}_N(\tau)$ be the set of $\omega \in \mathsf{BA}_N$ that avoid the pattern τ (i.e., as a sequence, ω has no subsequence with the same relative order as τ).

We focus on the decreasing pattern $Decr_k := \mathbf{k}(\mathbf{k{-}1})\cdots\mathbf{321}$ for fixed $k \geq 3$. We obtain the exact asymptotic behaviour of $|\mathsf{AvBA}_N(Decr_k)|$ as $N \to \infty$. We also describe a corresponding permuton-like result for $\mathsf{AvBA}_N(Decr_k)$. (Received September 10, 2019)