1086-05-1203 **Sergey Avgustinovich** and **Sergey Kitaev***, Depart. of Computer and Information Sciences, University of Strathclyde, Livingston Tower, 26 Richmond Street, Glasgow, G1 1XH, and **Alexandr Valyuzhenich**. *Crucial and bicrucial permutations with respect to arithmetic monotone patterns.*

An *arithmetic occurrence* of a pattern in a permutation is a subsequence of the permutation that is order isomorphic to the pattern and whose indices form an arithmetic progression. For example, in the permutation 6245371, there are two arithmetic occurrences of the pattern 123, namely 245 and 257. A permutation is (k,ℓ)-anti-monotone if it avoids arithmetically the patterns $12\cdots k$ and $\ell(\ell-1)\cdots 1$.

An *extension* of a permutation π of length n to the right (resp., left) is a permutation $\pi' x$ (resp., $x\pi'$) of length $n+1$ such that $x \in \{1,2,\ldots,n+1\}$ and π' is obtained from π by adding 1 to each letter that is more or equal to x. A permutation π is (k,ℓ)-*crucial* (resp. (k,ℓ)-*bicrucial*) if π is anti-monotone but any extension of π to the right (resp., and to the left) is not (k,ℓ)-anti-monotone. For example, the permutation 216453 is $(3,3)$-crucial, while the permutation 73418562 is $(3,3)$-bicrucial.

We are interested in the following questions in which we assume $k,\ell \geq 3$: Do there exist (k,ℓ)-(bi)crucial permutations? If so, what is the minimum length of such permutations? Do arbitrary long (k,ℓ)-(bi)crucial permutations exist? (Received September 20, 2012)