1111-13-231 **Santiago Zarzuela*** (szarzuela@ub.edu), Departament d'Àlgebra i Geometria, Universitat de Barcelona, Gran Via 585, E-08029 Barcelona, Barcelona, Spain. *Shifted numerical semigroups and their tangent cones.* Preliminary report.

Given a numerical semigroup $S = \langle m_1, \dots m_d \rangle$ we may consider for any $j \in \mathbb{N}$ the shifted numerical semigroup $S + j = \langle m_1 + j, \dots, m_d + j \rangle$. It has been recently proved by J. Herzog and D. I. Stamate that for $j \gg 0$ the tangent cone of $S + j$ is Cohen-Macaulay. The proof of this result is based on work by T. Vu proving a conjecture of Herzog- Srnivasan saying that the Betti numbers of the defining ideals $S + j$ are eventually periodic in j with period $m_d - m_1$. As a consequence, the bound N depends on the regularity of the ideal generated by the homogeneous elements of the defining ideal of S. By using more direct numerical semigroups techniques we give a new proof of the result by Herzog and Stamate, providing a bound K which does not depend on the above regularity and that can be easily computed in terms of the generators of S. In fact, it only depends on what we call the *shifting type of a numerical semigroup*. We also analyze this condition in the context of what we call *numerical semigroups of homogeneous type*, that is, numerical semigroups such that their Betti numbers and the ones for their tangent cones coincide.

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