On the elasticity of a numerical semigroup

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Abstract. Let S be a numerical semigroup, and $\operatorname{msg}(S)$ its minimal system of generators. Then $\operatorname{m}(S) = \min(\operatorname{msg}(S))$, $\operatorname{M}(S) = \max(\operatorname{msg}(S))$, $\operatorname{e}(S)$, which is the cardinality of $\operatorname{msg}(S)$, and $\mathscr{S}(S) = \frac{\operatorname{M}(S)}{\operatorname{m}(S)}$, are called the multiplicity, comultiplicity, embedding dimension, and elasticity of S, respectively.

Let m and M be positive integers, and let q be a rational number greater than 1. In this paper, we will study the following sets:

- $\{S \mid S \text{ is a numerical semigroup, } m(S) = m \text{ and } M(S) = M\},$
- $\{S \mid S \text{ is a numerical semigroup, } m(S) = m \text{ and } \mathcal{S}(S) \leq q\}$, and
- $\{S \mid S \text{ is a numerical semigroup, } e(S) = 3 \text{ and } \mathscr{S}(S) = q\}.$

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 $Mathematics\ Subject\ Classification:\ 20M14,\ 11D07,\ 20M13.$

Key words and phrases: numerical semigroup, packed numerical semigroup, Frobenius number, genus, multiplicity, comultiplicity, algorithm, Frobenius pseudo-variety.