1106-11-1023 **Wolfgang A. Schmid*** (`schmid@math.univ-paris13.fr`). *When is the sum of two sets of lengths a set of lengths?*

Let H be a (commutative) atomic monoid, that is a commutative cancellative semi-group where each element can be written as a product of irreducible elements. For a non-invertible element $b \in H$ we say that n is a length of b if there exist irreducibles $a_1, \dots, a_n$ such that $b = a_1 \dots a_n$. We denote by $L(b)$ the set of all n such that n is a length of b; for an invertible element b we set $L(b) = \{0\}$.

The question to be discussed in this talk is under which conditions (on H) the set $L(b)+L(b') = \{n+n' \colon n \in L(b),\, n' \in L(b')\}$, for $b, b' \in H$, is guaranteed to be again a set of lengths, that is $L(b) + L(b') = L(c)$ for some $c \in H$. Note that $L(b) + L(b') \subset L(bb')$ but the inclusion can be strict.

In particular, we give a complete answer for the case of Krull monoids where each class contains a prime divisors.

This is joint work with A. Geroldinger. (Received September 09, 2014)