

1116-VA-1933 **Furuzan Ozbek*** (fzo0005@auburn.edu), **Edgar Enochs** (e.enochs@uky.edu) and **Overtoun Jenda** (jendaov@auburn.edu). *Submonoids of the Formal Power Series*. Preliminary report.

Formal power series come up in several areas such as formal language theory , algebraic and enumerative combinatorics semigroup theory, number theory etc. With the intention of finding applications for undergraduate research workshop at MASAMU Advanced Study Institute, we have been working on the the subset $xR[[x]]$ consisting of formal power series with zero constant term. This subset forms a monoid with the composition operation of series. We classify the sets T of strictly positive integers for which the set of formal power series

$$R[[x^T]] = \left\{ \sum_{t \in T} a_t x^t \mid \text{where } a_t \in R \right\}$$

forms a monoid with composition as the operation. We prove that in order for $R[[x^T]]$ to be a monoid, T itself has to be a submonoid of (\mathbb{N}, \cdot) . Unfortunately, this condition is not enough to guarantee the desired result. But if a monoid is *strongly closed*, then we get the desired result. We also consider an analogous problem for power series in several variables. (Received September 21, 2015)