1163-03-829 **Rumen Dimitrov**, **Valentina Harizanov**, **Andrey Morozov** and **Paul Shafer*** (p.e.shafer@leeds.ac.uk), School of Mathematics, University of Leeds, Leeds, LS2 9JT, United Kingdom, and **Alexandra Soskova** and **Stefan Vatev**. *Cohesive powers of linear orders.*

A cohesive power of a computable structure is an effective analog of an ultrapower where a cohesive set acts as an ultrafilter. We study cohesive powers of computable copies of ω, which are computable linear orders that are isomorphic to $(\mathbb{N}, <)$, but not necessarily by computable isomorphisms.

Every cohesive power of the standard presentation of ω has order-type $\omega + \zeta\eta$, which is expected because $\omega + \zeta\eta$ is the familiar order-type of countable non-standard models of PA. We show that it is possible for cohesive powers of computable copies of ω to exhibit a variety of order-types:

- There is a computable copy of ω with a cohesive power of order-type $\omega + \eta$.
- For every finite, non-empty $X \subseteq \mathbb{N} \setminus \{0\}$ (thought of as a set of finite order-types), there is a computable copy of ω with a cohesive power of order-type $\omega + \sigma(X)$. Here σ denotes the shuffle operation.
- For every $X \subseteq \mathbb{N} \setminus \{0\}$ that is either Σ^0_2 or Π^0_2, there is a computable copy of ω with a cohesive power of order-type $\omega + \sigma(X \cup \{\omega + \zeta\eta + \omega^*\})$.

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