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New Algorithms for Generating Arbitrary Kochen-Specker Sets NORMAN D. MEGILL, Boston Information Group, Lexington, MA 02420, USA, MLADEN PAVICIC, University of Zagreb, Croatia — The Kochen-Specker (KS) sets (constructive proofs of quantum contextuality) have recently obtained a special significance as building blocks of quantum information protocols since quantum contextuality was revealed as property complementary to nonlocality and entanglement. [A. Cabello, *Phys. Rev. Lett.* **104**, 220401 (2010).] Thus, generating arbitrary KS sets becomes as needed as generating Bell states and this has been enabled by recent findings of a vast amount ($> 10^{20}$) of new KS sets—we call them a “KS sea.” [N.D. Megill, K. Fresl, M. Waegell, P.K. Aravind, and M. Pavičić, *Phys. Lett. A*, **375** 3419 (2011); M. Waegell and P.K. Aravind, *J. Phys. A* [to appear] (2011).] Here we present our newest algorithms and computer programs which enable us to obtain any desired KS set from the KS sea in a very short time without ever making a complete data base of KS sets—which would be an impossible task anyhow. This was made possible with the help of our representation of the KS sea as well as individual KS sets by means of MMP hypergraphs.

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