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**Michael E. Hoffman\*** (meh@usna.edu), Dept. of Mathematics, U.S. Naval Academy, 572C  
Holloway Rd., Annapolis, MD MD 21402. *Multiple harmonic sums and quasi-symmetric functions.*  
Preliminary report.

Multiple harmonic sums of the form

$$S_{j_1, \dots, j_k}(n) = \sum_{n \geq i_1 \geq \dots \geq i_k \geq 1} \frac{1}{i_1^{j_1} \cdots i_k^{j_k}}$$

have appeared in the physics literature in connection with Feynman diagrams and Mellin transforms. Such sums are homomorphic images of certain elements of the algebra QSym of quasi-symmetric functions, which was first introduced by Gessel and whose structure has since been studied by Reutenauer, the author, and others. We present a description of the algebra of harmonic sums, which has some features that persist as  $n \rightarrow \infty$  (giving the algebra of multiple zeta values), but also some features unique to the case  $n < \infty$ . (Received September 07, 2000)