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**Michael Bradley Henry\*** (mbhenry@siena.edu), Department of Mathematics, Siena College, Loudonville, NY 12211, and **Daniel R Rutherford**, Department of Mathematics, University of Arkansas, Fayetteville, AR 72701. *A combinatorial differential graded algebra for Legendrian knots from generating families.*

A generating family for a Legendrian knot  $L$  in the standard contact structure on  $\mathbb{R}^3$  is a function whose critical values encode the  $xz$ -projection of  $L$ . The current results contribute to a long-running program to prove deep connections exist between Legendrian invariants derived from generating families and those derived from the Chekanov-Eliashberg DGA. An algebraic analogue of generating families was defined by Petr Pushkar and has proven to be a useful and computable alternative. These objects are known as Morse complex sequences, abbreviated MCS. The definition of an MCS is geometrically motivated by the fiber-wise Morse-Smale chain complexes coming from a suitably generic generating family and metric for  $L$ . Our current work associates a differential graded algebra, abbreviated DGA, to an MCS. The DGA is geometrically motivated by Morse-theoretic techniques applied to generating families. The linear homology of the DGA is a Legendrian invariant and if the MCS is a special type, then the DGA is stable tame isomorphic to the Chekanov-Eliashberg DGA of  $L$ . (Received August 26, 2011)