1087-11-89 **Joseph A Vandehey*** (vandehe2@illinois.edu), Department of Mathematics, 1409 W Green Street, Urbana, IL 61801. *Exponential sums, the van der Corput transform, and Cornu spirals.*

The van der Corput transform (also known as process B in the theory of exponent pairs) can take a difficult exponential sum, $\sum g(n) \cdot exp(2\pi i f(n))$, and return a new exponential sum that is—hopefully—more easily estimated. However, this transform comes at the cost of a large error as well as restrictive conditions on the functions f and g. We will present new results which give the leading term of the error explicitly and can also be applied to many more general sums. These results help to explain the beautiful spirals that appear when the partial sums of an exponential sum are plotted. (Received November 29, 2012)