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Shelly Harvey* (shelly@rice.edu), **Tim Cochran** and **Peter Horn**. *Filtering Smooth Concordance classes of Topologically Slice Knots.*

The n -solvable filtration of the smooth knot concordance group, due to Cochran-Orr-Teichner, is flawed in the sense that any topologically slice knot lies in every term of the filtration. In order to correct this we define and investigate a new filtration of the smooth knot concordance group and show that the quotients of each of its successive terms have infinite rank. Our primary interest is in the induced filtration, $\{T_n\}$, on the subgroup, T , of knots that are topologically slice. We prove that T/T_0 is large, detected by gauge-theoretic invariants and the τ , s , and δ -invariants; while T_0/T_1 is detected by certain d -invariants. Going beyond this, our main result is that T_1/T_2 has rank at least one. Under a weak “homotopy-ribbon” condition, we show that each of the higher terms T_n/T_{n+1} has positive rank. Our filtration is simultaneously a refinement of the n -solvable filtration and a generalization of notions of positivity due to Gompf and Cochran. (Received January 18, 2012)