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**Pace P Nielsen\*** ([pace@math.byu.edu](mailto:pace@math.byu.edu)), Department of Mathematics, Brigham Young University, Provo, UT 84602. *Wieferich primes, heuristics, and computations*. Preliminary report.

A prime  $p$  is a Wieferich prime if  $2^{p-1}$  is equivalent to 1 modulo  $p^2$ . This condition is a straightforward strengthening of Fermat's little theorem. Wieferich primes were initially introduced in connection to the first case of Fermat's last theorem. Only two such primes are currently known, while heuristics suggest that there should be infinitely many and that we are long overdue for the next one. In this talk, we compare these heuristics with a large amount of computational data. (Received July 06, 2011)