1035-Z1-1546   **Dominic W Klyve*** (`dklyve@carthage.edu`), Department of Mathematics, Carthage College, 2001 Alford Drive, Kenosha, WI 53140, and **François G Dorais**. *A search for Wieferich primes to* 6×10^{15}.

Fermat's Little Theorem establishes that for all primes p, $2^{p-1} \equiv 1 \pmod{p}$. A prime is called *Wieferich* if it satisfies the further equivalence $2^{p-1} \equiv 1 \pmod{p^2}$. Such primes were studied by A. Wieferich as possible solutions to Fermat's Last Theorem. To date, although extensive searches have been undertaken, only two Wieferich primes, 1093 and 3511, are known, discovered in 1913 and 1922, respectively. We describe a new algorithm developed to search for Wieferich primes, which we used to extend the search to the interval $[1.25 \times 10^{15}, 6 \times 10^{15}]$. Though we did find several *near-Wieferich primes* in this interval, we failed to find any new Wieferich primes. (Received September 20, 2007)