1145-11-349   **Steven H. Weintraub*** (`shw2@lehigh.edu`), Dept. of Mathematics, Lehigh University,
Bethlehem, PA 18015. *Periodicity of Certain Generalized Continued Fractions.*

We have previously considered continued fractions with "numerator" a positive integer N, which we refer to as cf_N expansions. In particular, let E be a positive integer that is not a perfect square. For $N > 1$, $\sqrt{E}$ has infinitely many cf_N expansions. There is a natural notion of the "best" cf_N expansion of $\sqrt{E}$. We have conjectured, based on extensive numerical evidence, that such a best expansion is not always periodic. From this evidence, it is difficult to predict for which N this expansion will be periodic. We show here that for any such E, there are infinitely many values of N for which this expansion is indeed periodic, more precisely, periodic of period 1 or 2, and we obtain formulas for a subset of these expansions in terms of solutions to Pell's equation $x^2 - Ey^2 = 1$. (Received September 03, 2018)