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*Pisot sequences with periodic rounding rules*

The classical Pisot sequence  $E(a_0, a_1)$  is defined by the non-linear recurrence  $a_{n+2} = N(a_{n+1}^2/a_n)$ , where  $a_0 < a_1$  are positive integers and  $N(x)$  means round  $x$  to the nearest integer. One can define a variety of different sequences by replacing  $N(x)$  by  $U(x)$  or  $D(x)$  where these mean round  $x$  up or down to the closest integer, respectively. Here we consider rounding rules which apply the operators  $U$  and  $D$  in a periodic fashion, e.g. the sequence  $UUDUD(a_0, a_1)$  would start by rounding up for the next two rounds, then down, then up, then down, repeating this indefinitely. One is interested in subset of such sequences which satisfy linear recurrence relations. We show that there is a striking difference between the case in which the rounding rule has minimal period at most 2, and the case in which this period is greater than 2. The results have some applications to questions about classical Pisot sequences.