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*On the Diophantine equation  $\sum_{k=1}^5 F_{n_k} = 2^a$ ,*

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**Abstract**

Let  $(F_n)_{n \geq 0}$  be the Fibonacci sequence given by  $F_0 = 0, F_1 = 1$  and  $F_{n+2} = F_{n+1} + F_n$  for  $n \geq 0$ . In this paper, we have determined all the powers of 2 which are sums of five Fibonacci numbers with few exceptions that we characterize. We have also stated an open problem relating to the number of solutions of equations like those studied in this paper.