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*On Some New Sums of Fibonomial Coefficients*,
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**Abstract**

Let $F_n$ be the $n$th Fibonacci number. The Fibonomial coefficients $\begin{bmatrix} n \\ k \end{bmatrix}_F$ are defined for $n \geq k > 0$ as follows

$$\begin{bmatrix} n \\ k \end{bmatrix}_F = \frac{F_n F_{n-1} \cdots F_{n-k+1}}{F_1 F_2 \cdots F_k},$$

with $\begin{bmatrix} n \\ 0 \end{bmatrix}_F = 1$ and $\begin{bmatrix} n \\ k \end{bmatrix}_F = 0$ for $n < k$. In this paper, we shall provide some interesting sums among Fibonomial coefficients. In particular, we prove that

$$\sum_{j=0}^{4m+2} (-1)^{\frac{j}{2}(j+1)} \begin{bmatrix} 4m+2 \\ j \end{bmatrix}_F F_{n+4m+2-j} = 0,$$

holds for all non-negative integers $m$ and $n$.