

1161-54-202

**Yuanan Diao, Michael Lee Finney and Dawn Ray\***, Fretwell 376, 9201 University City Blvd.,  
Charlotte, NC 28223. *The number of oriented rational links with a given deficiency number.*

Let  $\mathcal{U}_n$  be the set of un-oriented and rational links with crossing number  $n$ , a precise formula for  $|\mathcal{U}_n|$  was obtained by Ernst and Sumners in 1987. In this paper, we study the enumeration problem of oriented rational links. Let  $\mathcal{M}_n$  be the set of oriented rational links with crossing number  $n$  and let  $\mathcal{M}_n(d)$  be the set of oriented rational links with crossing number  $n$  ( $n \geq 2$ ) and deficiency  $d$ . In this paper, we derive precise formulas for  $|\mathcal{M}_n|$  and  $|\mathcal{M}_n(d)|$  for any given  $n$  and  $d$  and show that

$$|\mathcal{M}_n(d)| = F_{n-d-1}^{(d)} + \frac{1 + (-1)^{nd}}{2} F_{\lfloor \frac{n}{2} \rfloor - \lfloor \frac{d+1}{2} \rfloor}^{(\lfloor \frac{d}{2} \rfloor)},$$

where  $F_n^{(d)}$  is the convolved Fibonacci sequence. (Received August 17, 2020)