Eigenvalues and $[a, b]$-factors in regular graphs

Suil O
SUNY Korea
suil.o@sunykorea.ac.kr

For positive integers, $r \geq 3, h \geq 1$, and $k \geq 1$, Bollobás, Saito, and Wormald proved some sufficient conditions for an h-edge-connected r-regular graph to have a k-factor in 1985. Lu gave an upper bound for the third-largest eigenvalue in a connected r-regular graph to have a k-factor in 2010. Gu found an upper bound for certain eigenvalues in an h-edge-connected r-regular graph to have a k-factor in 2014.

For positive integers $a \leq b$, an even (or odd) $[a, b]$-factor of a graph G is a spanning subgraph H such that for each vertex $v \in V(G)$, $d_H(v)$ is even (or odd) and $a \leq d_H(v) \leq b$. In this talk, we provide best upper bounds (in terms of a, b, and r) for certain eigenvalues (in terms of a, b, r, and h) in an h-edge-connected r-regular graph G to guarantee the existence of an even $[a, b]$-factor or an odd $[a, b]$-factor. This result extends the one of Bollbás, Saito, and Wormald, the one of Lu, and the one of Gu.