國立中山大學應用數學系
學術演講

講　者：朱緒鼎 教授(浙江大學)

講　題：Hedetniemi’s conjecture and the Poljak-Rödl function (1), (2)

時　間：2020/1/20（Monday）14:10 ~ 16:00

地　點：理學院四樓理 SC 4009-0 多功能互動教室

茶　會：13:30 於理 SC 4010 室 (系辦公室)

Abstract

Hedetniemi conjectured in 1966 that for any graphs G, H, $x(G \times H) = \min\{x(G), x(H)\}$. This conjecture received a lot of attention in the past half century. It is disproved recently by Shitov. The Poljak-Rödl function is defined as $f(n) = \min\{x(G \times H)\colon x(G) = x(H) = n\}$. Hedetniemi's conjecture is equivalent to say that $f(n) = n$ for all integer n. Shitov's result shows that for sufficiently large n, $f(n) < n$. Using Shitov's result as a blackbox, Tardif and Zhu showed that for sufficiently large n, $f(n) \leq n - (\log n)^{1/4}$. Using Shitov's method, He and Wigderson showed that for $\epsilon \approx 10^{-9}$, for sufficiently large n, $f(n) \leq (1-\epsilon)n$. Very recently, I observed that a slight modification of

the proof in the paper by Tardif and Zhu shows that for sufficiently large n, $f(n) \leq \left(\frac{1}{2} + o(1)\right)n$. On the other hand, it is unknown if $f(n)$ is bounded by a constant. However, we do know that if $f(n)$ is bounded by a constant, then the smallest such constant is at most 9. In this lecture, I give self-contained proofs of the above mentioned results.

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