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## 基于DMSP/OLS影像的我国主要城市群空间扩张特征分析

### Analysis of the spatial expansion characteristics of major urban agglomerations in China using DMSP/OLS images

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#### 中文摘要:

20世纪90年代以来,随着中国城市化步伐的加快,城市用地空间扩张极为明显。采用1992、1995、2000、2005、2009年5期的夜间灯光影像数据提取了京津冀、长江三角洲和珠江三角洲城市群的城市像元,并从空间扩张强度、扩张类型以及方向性空间扩张特征3个方面对三大城市群城市用地的空间扩张特征进行了分析,同时还从社会经济方面对城市群空间扩张的驱动因素进行了讨论。结果表明,三大城市群的空间扩张特征既存在共性也存在明显的差异,同时社会经济的快速发展对城市用地的扩张具有明显的驱动作用,为进一步推动中国城市化进程提供了数据支撑。

#### English Summary:

Since the 1990s, the urban sprawl phenomenon has become very obvious in China due to the pace of urbanization. We extracted urban pixel of Jingjinji, Yangtze River Delta and Pearl River Delta urban agglomerations based on DMSP/OLS images in 1992, 1995, 2000, 2005 and 2009. We also analyzed the spatial expansion characteristics of urban land in the three agglomerations. We calculated the spatial expansion intensity and spatial expansion type in the three agglomerations. Then we analyzed the directional spatial expansion characteristics and compared them to the level of socio-economic development (population urbanization rate and the proportion of secondary and tertiary industry in GDP) in the cities within the three urban agglomerations. The results showed that (1) the intensity of spatial expansion in the Yangtze River Delta was higher than the other regions during the early and middle stages of spatial expansion, the intensity of spatial expansion in Jingjinji was higher than in the other regions during the late stage of urban expansion, and the intensity of urban expansion in the Pearl River Delta was relatively weak. (2) The 'infilling' type of spatial expansion was observed in all three urban agglomerations until 2009. (3) Urban land in Jingjinji expanded east, south and southeast from the centers of Beijing, Tianjin and Tangshan. Urban land in the Yangtze River Delta expanded west, southwest and northwest from the center of Shanghai, and expansion in local areas was centered around several urban patches, and urban land in the Pearl River Delta expanded around the central urban clusters. (4) From 1992 to 2009, the social economic development level, population urbanization rate and the proportion of secondary and tertiary industry in GDP in Beijing, Tianjin and Tangshan were higher than the other cities in the Jingjinji. The population urbanization rate and the proportion of secondary and tertiary industry in GDP of Shanghai, Nanjing, Wuxi and Suzhou were higher than the other cities in the Yangtze River Delta, and the population urbanization rate and the proportion of secondary and tertiary industry in GDP of Guangzhou, Shenzhen, Zhongshan, Zhuhai, Dongguan and Foshan were higher than the other cities in the Pearl River Delta. These results all indicated that rapid socioeconomic development drives the expansion of urban land. (5) The general spatial expansion trend of urban land in the three agglomerations was from dispersed to cluster form, and the urban land gradually expanded as a banded or clustered interlocking region. We conclude that urban land in China forms clusters as a result of rapid socioeconomic development, the characteristics of urban land expansion varies in different agglomerations, and the analysis provides data support for continued urbanization in China.

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