

## 高精度地下水示踪技术及其应用——以毛村地下河流域为例

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中文摘要: 笔者以桂林毛村岩溶地下河流域的示踪试验为例, 探索高精度地下水示踪方法在岩溶水文地质研究中的应用。实践证明, 该方法较传统示踪方法具有较大优势。试验中, 从地下河主出口回收I号示踪剂为34%, 地下水平均流速为35.3 m/h, 全部回收率约为60%~70%。示踪结果证实毛村地下河流域具有典型河间地块特征, 存在多个排泄出口, 水文地质边界较复杂; 主出口处示踪剂浓度变化呈宽域多峰, 说明具有多管道、沿途多个较大溶潭特征; II号示踪剂在所有接收点都没有收到, 其原因较为复杂和不确定。枯季部分地下水有沿西南方向断层排泄迹象, 雨季是否存在较大径流, 还需用示踪试验来证实; 流量不均衡, 排泄区可能存在潜流。

中文关键词: [高精度](#) [在线监测技术](#) [地下水示踪](#) [桂林毛村](#)

## A High Precision Underground Water Tracing Test Technique and Its Applications: A Case Study in Maocun Karst System, Guilin, Guanxi

**Abstract:** A multi-tracing test was performed by the authors in Maocun underground river system near Guilin to understand the hydrogeological conditions and spatial characteristics of the water-holding media and to probe into the application of the high precision online tracing test technique to hydrogeological research. Practice shows that the new method is greatly superior to the traditional ones. The recovery rate of the injected tracer (uranine) at the main outlet is 34%, and the average speed of underground water flow is 35.3 m/h. It is estimated that 60%~70% of the total injected tracer was recovered during the tracing test. The final results indicate that the complicated underground system is located in an interfluvial area between the Maocun River and the Ganjiang paleo-river with several draining outlets, some of which remain unknown to us. The variation curve with several tracer concentration peaks recorded at the main outlet also indicates that there exist conduits and pools on the way the tracer migrates to the main outlet. There is a trail showing that the underground water moves to the southwestern part of the catchment through a fault (belt) in the dry season; nevertheless, further tracing test is needed to make sure if the water would overflow in this direction during the raining season. Another tracer, sulforhodamine B, was not detected at any receiving points because of several uncertain reasons. Moreover, the unbalance of discharge implies the possible existence of diving water flow in the drainage area.


**keywords:** [high precision](#); [online monitoring technique](#); [tracing of underground water](#); [Maocun](#) [Guilin](#)

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