

## 集水區型態對集流時間影響之研究

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**摘 要** 山坡地開發所帶來的影響不只是逕流量的增加，同時集流時間也會因此而縮短。若以逕流在集水區內流動的過程，可以明確的把逕流區分為從漫地流至渠道與渠道流至集水區出口點之時間予以分段估算。運動波理論具有較嚴謹之水理學基礎，可適用於各種地形、水文條件之集水區，因此本研究以運動波理論推導之漫地流與渠道流集流時間公式，配合敏感度分析公式以簡化之。在渠道流時間部分，主要取決於渠道長度；在漫地流時間上則受糙度及坡度之影響較大。本研究以集水區之形狀因子替代渠道長度參數對集流時間之影響，並配合 120mm/hr 以上高強度降雨下可忽略降雨強度之特性，進而導出集水區形狀因子與集水區集流時間之關係式。本研究並以水里溪集水區之地文資料驗證公式之準確性及適用性。此公式不但與分段估算法意義相同，所求參數更為簡潔、計算更簡便，又可以充分說明開發對集流時間影響及形狀因子與集流時間之關係。

**關鍵詞**：集流時間、運動波理論、敏感度。

## The Response of the Time of Concentration to Watershed Pattern

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**ABSTRACT** Land development on hillslope will result in increased peak discharge and decrease the time of concentration on the watershed. In this study, the time of concentration is calculated using the kinematic-wave theorem. From the sensitivity analysis, the significant factors of watershed pattern on the time of concentration are slope, land-covered and slope length. The time of concentration in the channel depends on the channel length that can be replaced by the form factor. Then the relation of the form factor to the time of concentration can be found. The equation is not only equivalent to calculating the time of concentration for overland and channel flows but also show the relation of the form factor and the time of concentration. Further, after analyzing the Shui-li Creek watershed, it is yielded the time of concentration in the experimental watershed has high accuracy.

**Key Words:** time of concentration, kinematic-wave, sensitivity analysis.

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