Table 7.1. Qualitative characteristics of PMP storm model in the San-Hua region of the Yellow River

No.	*Description*			*Characteristics*
1	Season the storm occurred			July–August
2	Weather cause	Atmospheric circulation type		Meridional midsummer
3		Storm weather system		Taking north–south shear lines as the dominant factor
4		Rain field distribution type		North–south strip distribution
5		Scope of rain field within the basin		Widespread precipitation within the San-Hua region basin
6	Rain type	Location of centre of storm	Yiluohe River	Middle reaches
			Qinhe River	Middle reaches
			Mainstream reach	Sanmenxia-Xiaolangdi region
7		Precipitation duration	Continuous precipitation	Approximately 10 days
			Storm duration	5 days
8	Storm temporal distribution type			Double and main peaks appear later

7.2.6 Comprehensive analysis using multiple methods

There are many methods available for determining PMP for the design watershed. The most common include the local model, the transposition model and combination model methods. For large watersheds, the major temporal and spatial combination method and storm simulation method based on historical flood are used for determining PMP.

Each method has its own theoretical basis as well as advantages, disadvantages and applicable conditions. Moreover, each method provides further options (for example: several typical storms or maximization methods are available for the local model method; the transposition model method can use several storms for transposition; the combination model method can use several combination methods). As a result, multiple methods or schemes, selected on data availability, should be used for comparative purposes. This will illuminate inconsistencies or contradictions. Then, a comprehensive analysis should be performed on results obtained from each method or scheme, enabling rational selection of PMP/PMF results to be used in the project design. Such a practice can also avoid the bias of results obtained with a single method or scheme, hence avoiding the situation in which the PMP/PMF result is underestimated.

The principle of "multiple methods, comprehensive analysis and rational selection" should be encouraged for hydrological engineering calculations.

7.2.7 Realistic results check

Methods for checking whether PMP/PMF results are realistic include the following six steps. The first two steps must be followed, but the remaining four steps are optional depending on data availability.

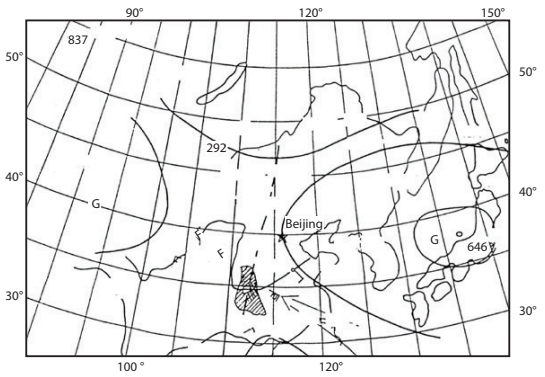

Figure 7.3. Generalized 700-hPa storm effect system map for 8 p.m. (Beijing time) 16 July 1958 in the catastrophic cloudburst period in the San-Hua region on the Yellow River (Wang G., 1999)