

渠系配水优化编组通用化软件的研发与应用

Research and development of general software for optimal irrigation water distribution and its application

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中文摘要:

针对国内外已开发的渠系优化配水软件存在的通用化程度不高的问题,在对渠系结构及优化配水模型抽象概化的基础上,以VC++6.0为开发平台,研制了一种渠系优化配水的通用化软件。该软件以渠系层状树形结构图、空间布局概化图、渠道特征参数数据库等直观表达复杂渠系上下级关系、空间布局和特征参数,并实现了上述图形与数据库的交互使用,使用户可以方便的完成复杂渠系的空间布局搭建、渠道特征参数的输入与修改。在对渠系配水过程分析的基础上,建立了所需参数少、通用性强、计算结果稳定可靠的渠系优化配水模型。并通过对模型特点的分析,提出

英文摘要:

Irrigation water optimization distribution plays an important role in improving irrigation management. A few of models and softwares were developed, but most of them need a lot of parameters and are designed for special irrigation system, thus it is often difficult to use in practice. In this paper, a general irrigation water distribution model that has less input parameters and stable calculated results is put forward and a model calculation method based on genetic algorithms is presented. The method is coded with the order number of alternative irrigation canal so the length of chromosome in genetic algorithms is cut down and the calculation is speeded up remarkably. Based on the model and algorithms, a general software for irrigation water optimal distribution was developed on the platform of VC++6.0. By use of irrigation canal layer CTreeView map, simplified canal space-layout map and canal parameter database, the software can directly demonstrate the complex linkage of upper and lower irrigation canals, space-layout structure and canal characteristic parameters of an irrigation system. The maps and the database above are linked dynamically, users can easily edit the complex irrigation system structural and space-layout map, modify the characteristic parameters of irrigation canals. The software is easy to operate, when inputting the requirements of irrigation water distribution, it can automatically transfer the relative canal characteristic parameters from the canal character parameters database to model computing program and then output the results of irrigation water optimal distribution. The software with visualized manual interface can be widely used in decision-making in irrigation water optimal distribution.

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