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# 基于Gompertz成长曲线的真空预压软土沉降规律分析

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**摘要** 对真空预压软土沉降变化规律进行分析, 发现其与社会经济预测中的Gompertz成长曲线变化规律相似。引入Gompertz成长曲线模型, 采用3段估计法求解模型参数; 同时, 结合具体工程实例, 对真空预压软土的表面累计沉降数据进行拟合和分析, 并与双曲线模型和指数曲线模型进行比较。研究表明, Gompertz成长曲线模型拟合曲线与实测曲线吻合良好, 采用该模型进行真空预压软土沉降变化规律分析是可行的, 并可根据所反映出的沉降发展变化趋势, 作出沉降预测, 计算工后沉降及确定卸荷时间。与双曲线模型和指数曲线模型比较, Gompertz成长曲线模型适应性较好, 趋势预测准确性高。最后指出应用Gompertz成长曲线模型进行分析时应注意抽真空的连续性、实测时间序列数据能等分成3组及保证实测沉降数据已进入弹塑性阶段等问题。

**关键词** [土力学](#); [软土](#); [真空预压](#); [沉降](#); [Gompertz成长曲线](#)

分类号

## LAW ANALYSIS OF SOFT SOIL SETTLEMENT TREATED BY VACUUM PRELOADING BASED ON GOMPERTZ GROWTH CURVE

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**Abstract**

After the law of settlement change analysis of soft soil treated by vacuum preloading method, it is found that the law is similar to that of Gompertz Growth Curve used in socioeconomic prediction. Based on practical engineering examples, the values of parameters of Gompertz Growth Curve by three-segment estimation method are achieved, and the Gompertz Growth Curve Model is established to analyze the settlement data of soft soil treated by vacuum preloading method and compared with Hyperbolic Model and Index Curve Model. The analytical results of engineering practice indicate that the effect of fitting curves by using this method is good and this method is reasonable to analyze the law of settlement change of soft soil treated by vacuum preloading method. It also can be used for predicting soft soil settlement, calculating post-construction settlement and unloading time decision. Compared with Hyperbolic Model and Index Curve Model, Gompertz Growth Curve Model has good adaptability and precision in trend forecast. Last, some problems such as continuing evacuation, three equal segment measured data and elastic-plastic deformation of soil, are pointed out during application of Gompertz Growth Curve Model.

**Key words** [soil mechanics](#); [soft soil](#); [vacuum preloading](#); [settlement](#); [Gompertz Growth Curve](#)

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