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**Mathematical investigation of the error self-compensation mechanism in optical coating technology.** (English) [Zbl 1409.74017](#)  
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**Summary:** The inverse problem of optical coatings control during their deposition is an important practical and industrial problem. The paper presents the mathematical investigation of the layer thickness errors self-compensation effect that is quite important for the quality production of modern types of thin film optical coatings. It studies the mechanism of thickness errors correlation in the case of direct monitoring of optical coating production by broadband online spectral photometric devices. The mathematical description of this mechanism is provided. The obtained results make it possible to predict the existence of a strong error self-compensation effect when theoretical optical coating design and parameters of the monitoring procedure are known. Mathematical results of the conducted research are confirmed by computational experiments with the data obtained for the optical coating design problem where a very strong error self-compensation effect has been practically observed.

**MSC:**

[74G25](#) Global existence of solutions for equilibrium problems in solid mechanics (MSC2010) Cited in **3** Documents  
[74K35](#) Thin films

**Keywords:**

[inverse problems](#); [error self-compensation](#); [optical coating technology](#); [optical monitoring](#)

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