

Effect of the substituent of the cation of N-octylpyridinium hexafluorophosphate in the electrical and electrochemical response of carbon paste electrodes modified with these ionic liquids

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Abstract

The continuous membrane stiffness of a deformable mirror propagates the deformation of the actuators beyond their neighbors. When phase-retrieval algorithms are used to determine the desired shape of these mirrors, this cross-coupling-also known as influence function (IF)-is generally disregarded. We study this problem via simulations and bench tests for different target shapes to gain further insight into the phenomenon. Sound modeling of the IF effect is achieved as highlighted by the concurrence between the modeled and experimental results. In addition, we observe that the actuators IF is a key parameter that determines the accuracy of the output light pattern. Finally, it is shown that in some cases it is possible to achieve better shaping by modifying the input irradiance of the phase-retrieval algorithm. The results obtained from this analysis open the door to further improvements in this type of beam-shaping systems.¹

Keywords: Carbon paste electrode | Carbon paste-ionic liquid electrode | Substituent effect | N-octylpyridinium hexafluorophosphate

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