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Coherent control of ZnPc photosensitising function

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Photoexcited photosensitising molecules trigger the formation of singlet oxygen, which leads to cell death. Such functional molecules have been successfully applied in photodynamic therapy of cancerous tumors. Aiming to improve such applications, we use two coherent control schemes to optimize the triplet yield in a model photosensitiser. In one scheme, the transmitted signal is analysed in the time-frequency domain. In the other scheme, different transmitted signals are integrated using three detectors. We show a minimum of 15% yield improvement using an evolution strategy learning-loop. A common bottle-neck of such learning loops is also handled to improve the yield of a test case by 10%; close to the theoretical limit.