

PRODUCTS OF FUNCTIONS IN THE HARDY SPACE \mathcal{H}^1 AND IN BMO, DIV-CURL LEMMAS

ALINE BONAMI

ABSTRACT. The interest in products of two functions, one in \mathcal{H}^1 and the other one in BMO, has started in a joint work with Iwaniec, Jones and Zinsmeister. We will speak of the strengthened following version, due to Luong Dang Ky, who is PhD student at Orléans: there exists two continuous bilinear operators, S and T , which map $\mathcal{H}^1 \times BMO$ respectively into L^1 and \mathcal{H}_w^Φ , such that $S(f, g) + T(f, g) = fg$. Here the product fg is given a meaning in the distribution sense and \mathcal{H}_w^Φ is an adapted weighted Hardy-Orlicz space. This decomposition is obtained through a wavelet decomposition of the product, in the same spirit as the ones of Dobyński.

For F and G two vector fields, which are respectively in \mathcal{H}^1 and BMO , and such that one of them is divergence free while the other one is curl free, then the scalar product $F.G$ is in \mathcal{H}_w^Φ . This last result, which is a variant of the classical div-curl lemma, has been obtained in a joint paper with Feuto and Grellier.

UNIVERSITÉ D'ORLÉANS