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GENERATION AND MOTION OF HIGH-ORDER MESHES BASED ON A HIGH-ORDER LINEAR ELASTICITY MODEL

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In the last decade, the use of high-order numerical schemes has significantly increased ([3]). To preserve the order of convergence, high order meshes are required. In this context, the generation and modification of high-order meshes appears to be necessary. In the same time, boundary layer meshes are still an important support for CFD computations. For this reason the generation of such meshes with high order curved elements becomes mandatory for the next years. Here, a technique to move high-order meshes is presented. This method is a generalization of an already existing method (see [1]) and lies on the existence of a high-order mesh generation model (some models of high-order mesh generation are presented in [4]). This model is based on a high-order linear elasticity finite element resolution. The use of the high-order linear elasticity equation is a way to curve an initial straight $\mathbb{P}_1$ mesh into a wanted $\mathbb{P}_k$ mesh and also a way to compute the moving mesh displacement on a high-order mesh. Based on this last feature, the already existing boundary layer generation process (see [2]) can be extended to the high order curved boundary layer mesh generation. The main difference with existing methods is that the curved boundary layer mesh is directly generated curved and not deformed in a second step.

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