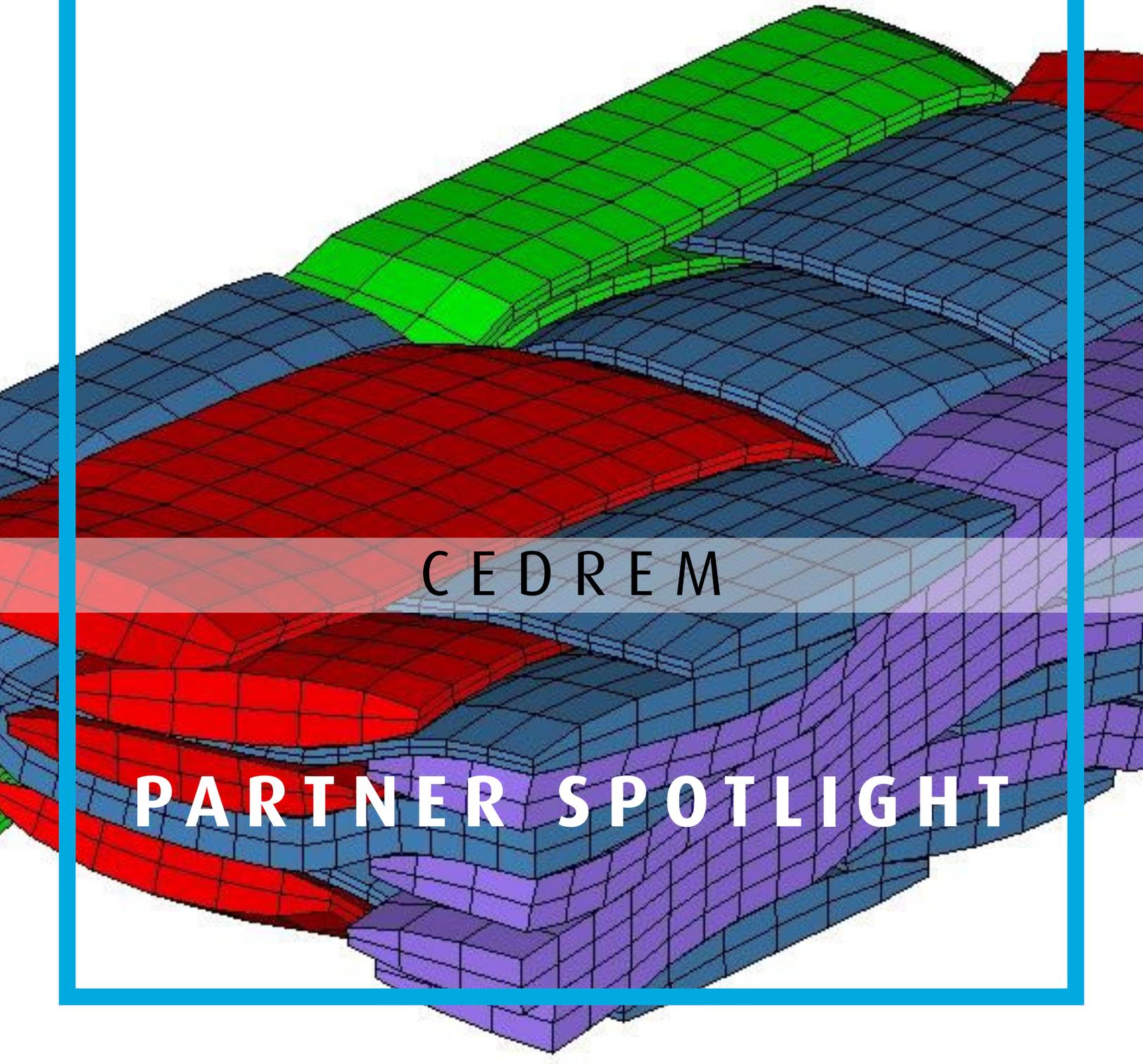




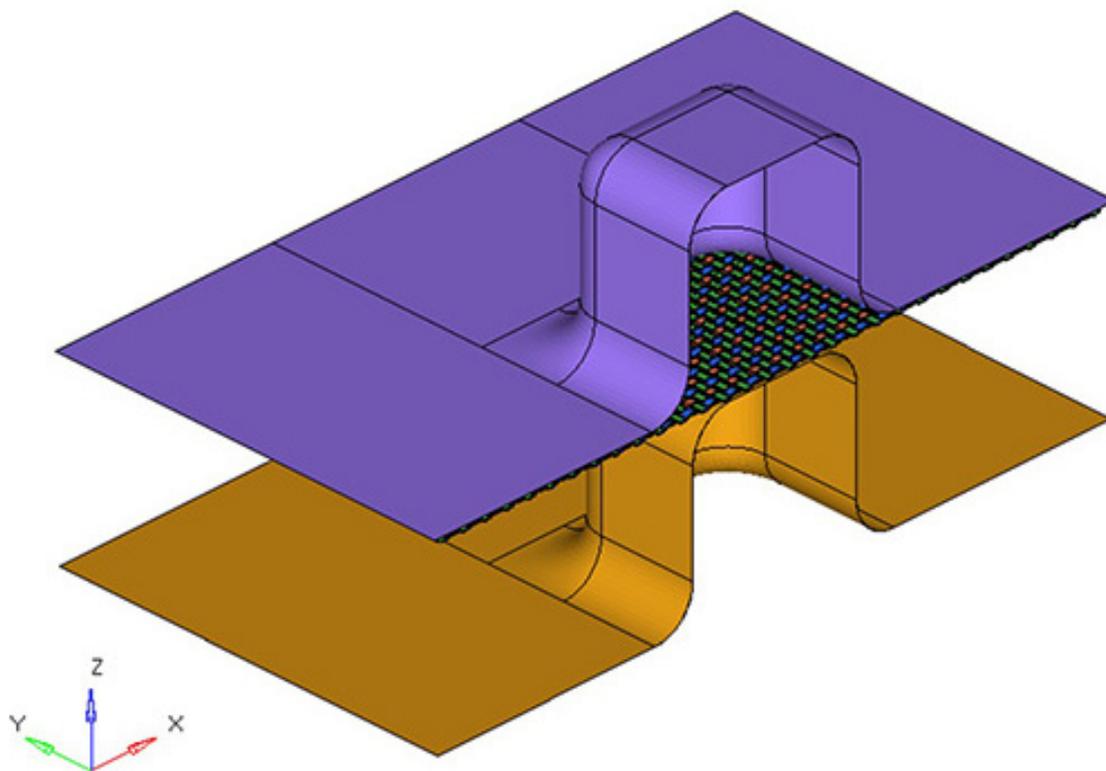
Altair

Partner Alliance



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PARTNER SPOTLIGHT



Partner Spotlight: CEDREM

Edouard Ferry, Engineer at CEDREM, discusses composites software, KTEX Family, available through the Altair Partner Alliance.

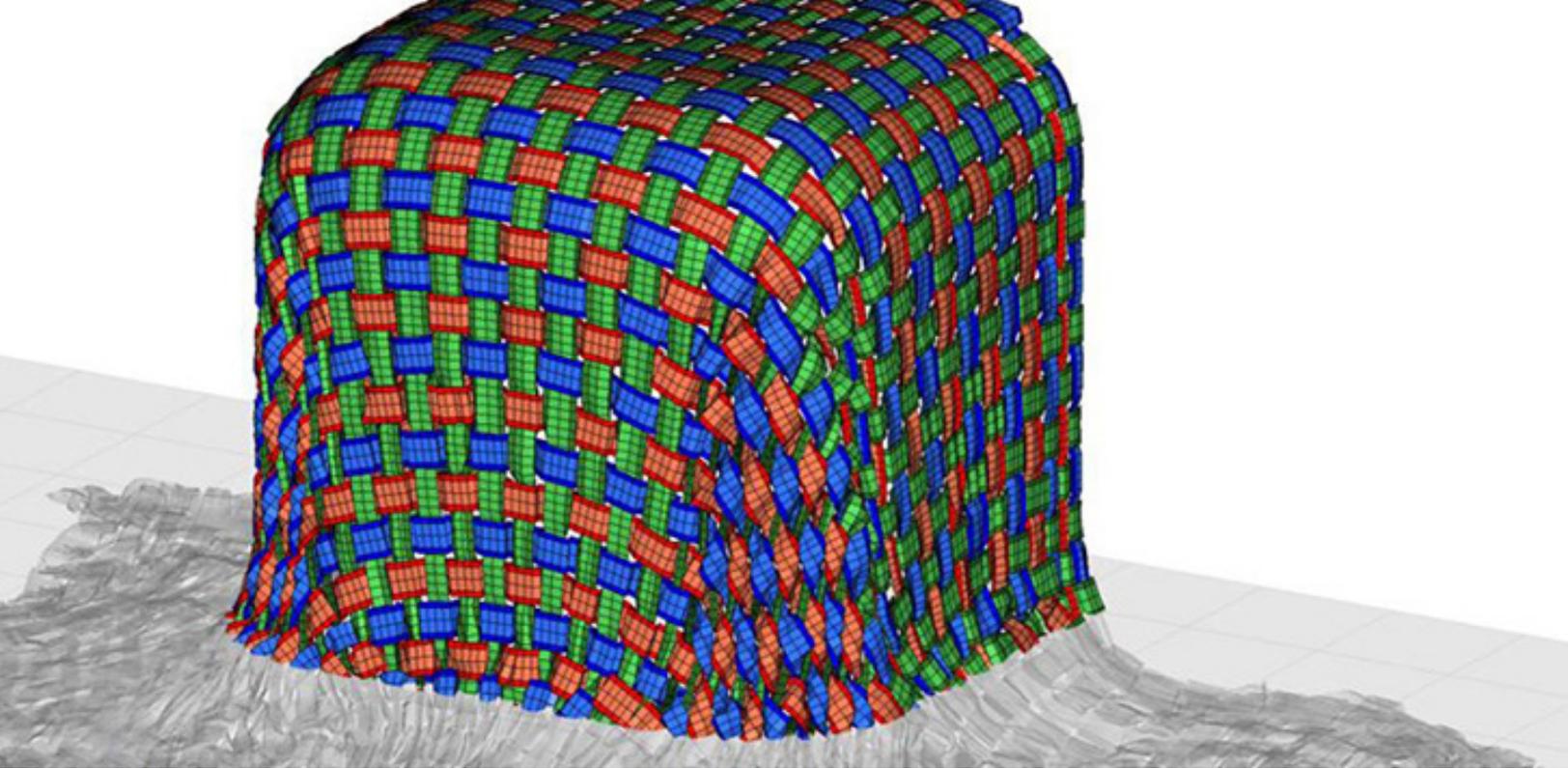
APA: What prompted the development of your software? What problem is KTex Family meant to solve?

Edouard: In our daily job, we are very much involved in high speed phenomena simulation and composite material. For some loading cases, same fiber and matrix association will give very different results depending on the weaving pattern of the composite material. The manufacturing process can also be of great impact on the mechanical properties of the final part. KTex Family aims at studying these aspects, from the best way to weave fibers together to reach targeted mechanical properties to measuring the impact of the manufacturing process on these properties.

Using KTex Family for composites enables the user to set a precise finite element (FE) model of any weave at the scale of the yarns. It will also enable a stacking of any kinds of composite weaves. Studying the impact of the manufacturing process on the performance of the weave is also possible. And a homogenization tool to calculate the mechanical properties of any composite ply available.

APA: What are the benefits of using KTex Family for composites?

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APA: Are there any unique applications that KTex Family works for that your competition cannot?

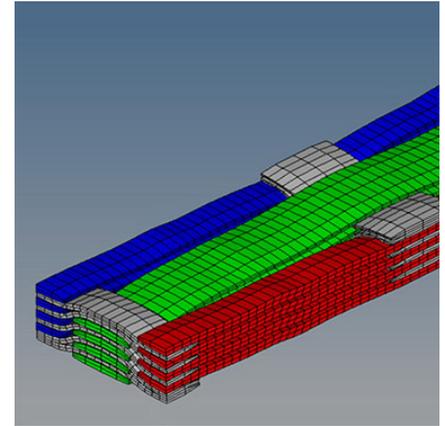
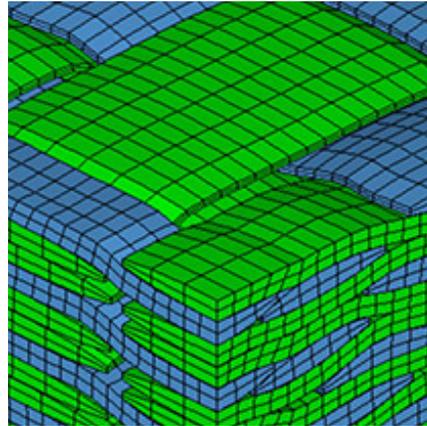
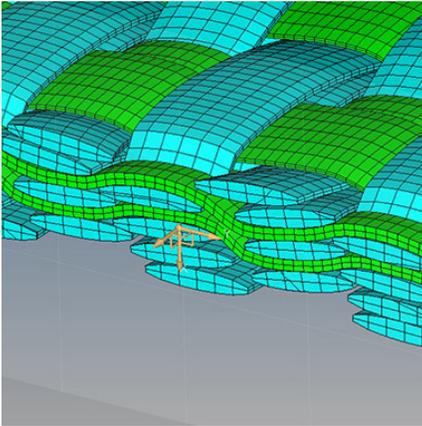
Edouard: All the aspects covered by the software are also covered by the competition, but by different tools. But in KTex Family, the first novelty is that all the aspects are covered with the same software. Another novelty lies in the compaction phase of the composite weaves. It is the first tool taking into account the mechanical properties of the yarns to simulate the compaction. This leads to a more realistic geometry of the compacted weave and to an accurate assessment of the yarns deformation and damage and interaction force between the yarns.

APA: How much time does it take to learn and start using your software?

Edouard: Depending on the fluency with HyperMesh, I would say two days are enough to learn how to use KTex Family, but more time might be needed if some background with HyperMesh is lacking.

APA: What are the biggest challenges or problems that customers in your target market face and how do you address their needs?

Edouard: One of the biggest challenge is to program a predictive tool validated for any weave and any manufacturing process. As composite allows creating bespoke configurations, the tools need to be adaptive and easy to handle. Another big challenge is to have fast running tools, in order to provide accurate results in a minimum of time. We address these needs by programming customizable tools producing optimized FE models. This allows the user to represent any configuration and to have models running fast not to slow them down during project work-flows.



APA: Describe a typical workflow of KTex Family.

Edouard: A typical workflow would be when a user wants to precisely simulate the behavior of a composite part, whether because a weakness has been observed or to initially design the part. Typical steps would then be to set up a FE model of the fabric with KTex Pattern. Then, it is possible to make “patches” of mesoscale fabric in a macroscale mesh where weakness areas have been observed. The manufacturing process can be simulated on this “patched” fabric to see if the orientation of the fiber change significantly and consequently modify the mechanical properties. And finally, the global loading case can be simulated on “manufactured patched” fabric to reproduce the weakness areas. It is then possible to optimize the weaving pattern or the manufacturing process to reduce and ideally delete these weaknesses.

APA: What’s new and exciting at CEDREM?

Edouard: We recently added our HUByx software to the Altair Partner Alliance. HUByx is a finite element model of the human body simulating all the bones and organs as well as the internal fluid in between them, enabling the propagation of pressure waves inside the body. We are hosting a webinar on Thursday, December 7th on our collaboration with DuPont on ballistic protection solutions. [Click here](#) to register.

For more information about [KTex Family](#) or [HUByx](#), visit the solution pages.