ABSTRACT PRESENTATION

Title: Cameras and LED walls - A challenging relationship
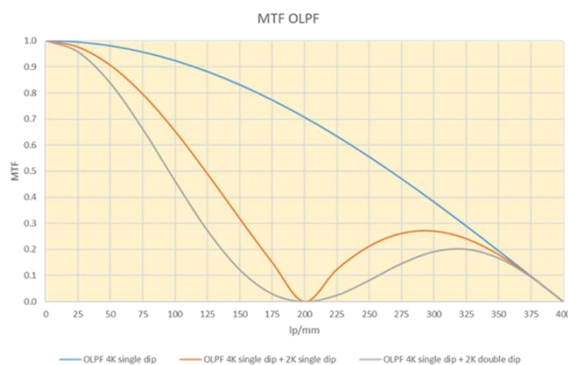Presenter name: Klaus Weber
Company name / Institute: Grass Valley
Project name: Mantis Vision
Funding group: Penta / Xecs / Euripides / ECSEL / KDT
Abstract can be published on website: ☒ **YES** ☐ **NO**

LED walls have become an important part of scene design in many media and entertainment applications, but LED walls are also being used more and more for virtual backgrounds and similar applications. However, there are several challenges in combination with cameras that often make it difficult to achieve an optimal result. A fundamental problem is that both the LED walls and the image sensors in the cameras use discrete pixel structures, which in certain cases can lead to interference between those two structures, so depending on the application, certain camera positions and image settings must be avoided, which in turn can lead to unwanted limitations in the image composition. There are limited ways to minimize this potential interference with a given LED wall, but on the camera side there are some ways to get the best possible result through optimized optical pre-filtering.

However, the extent of the problem depends heavily on the camera technology used. Cameras that have the same resolution for all three colours offer significantly more possibilities to enable the best possible optical pre-filtering for the circumstances.

In addition, new applications, especially in VR and AR, where the LED wall is operated at an increased frame rate, pose completely new challenges for image capture technology. For these challenges, it is of crucial importance that the image sensors in the camera have a global shutter, because this is the only way to expose and read out all image elements simultaneously in a short-time exposure. Additionally, there are possibilities, especially on the camera side, to create a smoother and easier integration of cameras into the production environment. For example, through new functionalities such as the implementation of a delay circuit between the image sensors and signal processing for shifting the exposure moment.
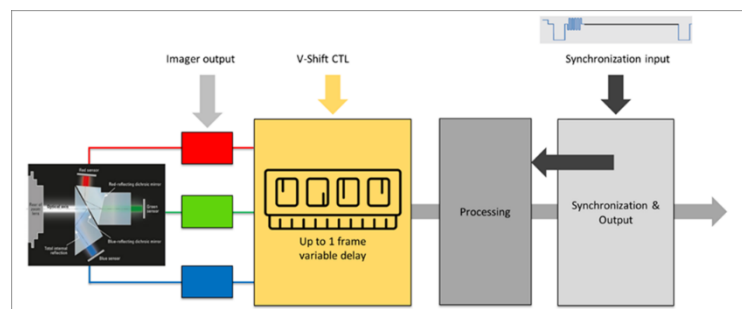
The paper addresses the challenges and potential solutions that arise from pixel structures, as well as the specific challenges and potential solutions that arise from increased refresh rates.