

# SEI message for transfer function

JCTVC-00064

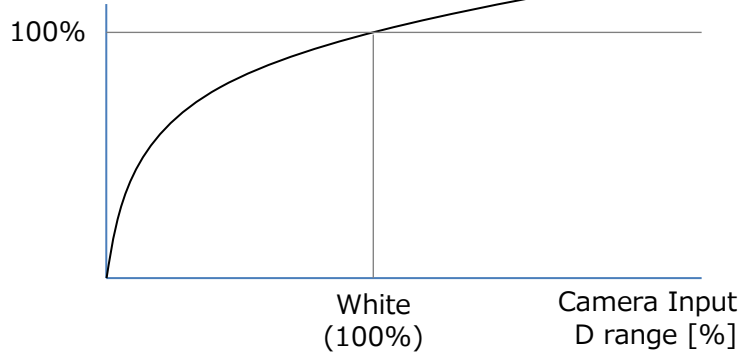
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# Introduction

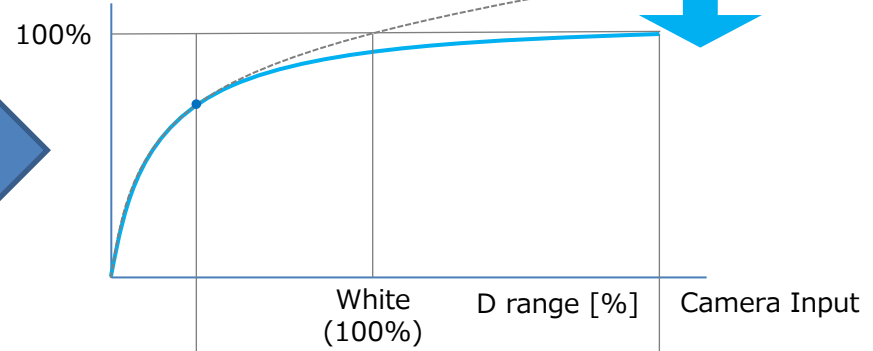
- Background
  - Today, the video cameras typically ameliorate their sensor's harsh clipping with a knee function which allows compression of the upper portion of the dynamic range.
  - Using knee function by camera or the video production process is widely being practiced today.
  - The purpose of using the knee function has been to fit the dynamic range of the pictures to the display brightness capability which is lower than what can be captured.
  - However, with the recent evolvement of the display brightness, many displays are becoming to be capable of displaying wider dynamic range with brighter luminance.
- Motivation
  - For these displays, providing parameters to enable decompressing the dynamic range to derive higher dynamic range can be very beneficial to make full use of the display capability.
- Proposal
  - Define an SEI message to transfer the characteristics of knee function.

# Knee Function

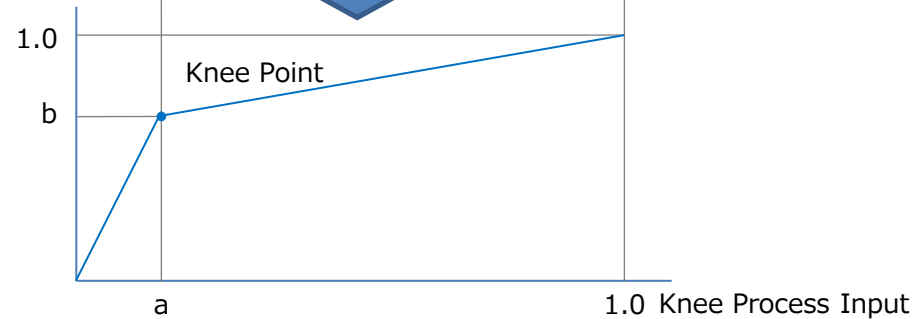
Camera Output



Camera Output



Knee Process Output



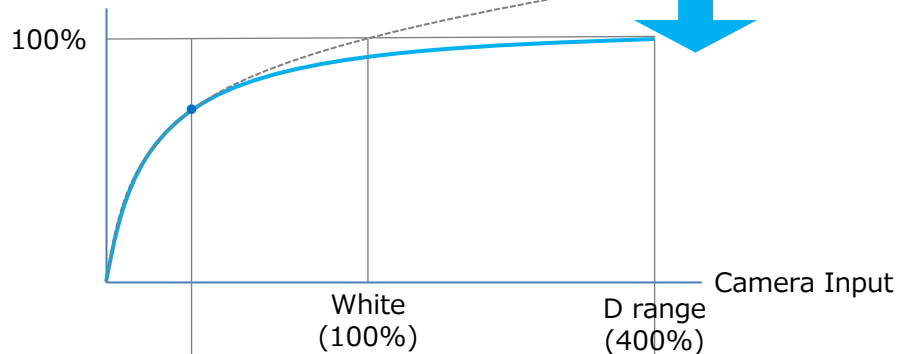
- Knee function: 2 lines which connects 3 points
  - Normalized in range of 0.0 to 1.0
  - 1) origin (0,0)
  - 2) knee point (a,b)
  - 3) (1,1).
  - The D range (Dynamic range) represents the peak signal level of the original picture in relative to the nominal luminance level.

# Proposal

knee_function_info ( payloadSize ) {	Descriptor
knee_function_id	ue(v)
knee_function_cancel_flag	u(1)
input_knee_point	u(16)
output_knee_point	u(16)
d_range	u(32)
d_range_disp_luminance	u(32)
}	

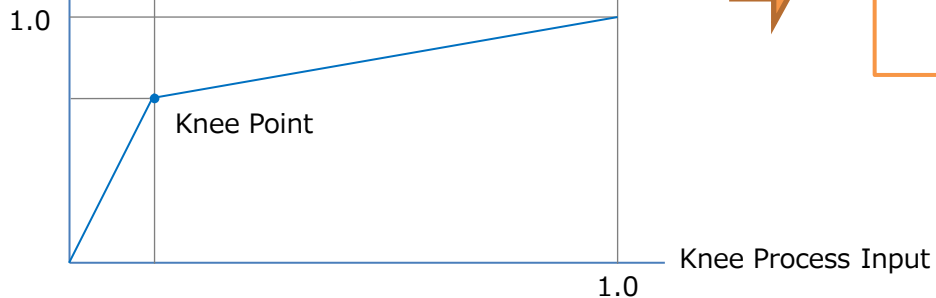
# Example of Knee Function parameters in SEI

Camera Output



## Knee Compression Function

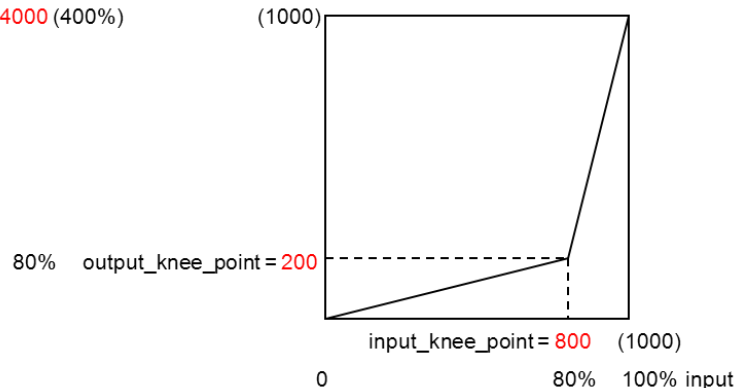
Knee Process Output



SEI will carry "decompression" Knee Function parameters

`d_range_luminance = 800cd/m2`

`d_range = 4000 (400%)`



## Conclusion

- It is desired to enable a function of delivering the knee function parameters to the displays to enable displays to make full benefit the dynamic range of the video.
- Proposed to define SEI message to transfer Knee function parameters.



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