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| *Title:* | **Parallelism tools mandatory at a given profile/level** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
| *Author(s) or Contact(s):* | Name(s) Mickaël Raulet  Pierre-Laurent Lagalaye Marco Mattavelli  Patrick Gendron | Tel: Email: | +33 2 23 23 82 83 [mraulet@insa-rennes.fr](mailto:mraulet@insa-rennes.fr), [marco.mattavelli@epfl.ch](mailto:marco.mattavelli@epfl.ch) |
| *Source:* | INSA Rennes, EPFL, Modae technologies, Thomson Video Networks | | |

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# Abstract

All technological reasons for which the clock speed of today's processor does not increase any more are well known to everybody. So as to exploit the silicon surface available with current deep submicron technologies, processor designers have increased the number of processing cores on each die. With the increasing of the image resolution of sequences encoded with HEVC, parallel decoding tools such as tiles [1] or wavefront parallel processing [2] have been proposed. Such tools present a minimal impact on the compression efficiency, but yield an important impact on the decoding time when parallel platform are used. The current version of the CD does only contain 1 profile where tools enabling parallel decoding are not mandatory. It means that conformant decoder implementations will have to support the worst case (i.e. no parallelized decoding implementation can be used) thus the potential of current platform technology cannot be exploited. . We propose that parallel tools with a minimal level of potential decoding parallelism become mandatory for each given profile/level (or at least for the levels that include HDTV resolution and beyond) , otherwise the usage of such tools will not be possible.

# Problem Statement

If parallel decoding tools are not mandatory at the encoder side and a minimal level of parallelism is not guaranteed for each profile and level, a decoder has to support the worst possible encoding option which is a single sequential decoding. It has been shown that HM HEVC decoding is quite comparable to JM 18.0 AVC decoding, and we can also notice than between the advent of AVC to a standard and today, processor clock speed has not been really increased, instead processor vendor have increased the available number of cores. Parallel decoding tools have been proposed in [1] and [2] to overcome this problem at the cost of a BD rate reduction of 0.7dB for a speed up factor ranging from 3 to 4.

Thus we propose to make mandatory parallelism tools for levels from 1080p 25 sequences which mean Main Profile L4.1 as 1080p25 becomes the de-facto standard picture size.

# Patent rights declaration(s)

**IETR/INSA, EPFL and Modae Technologies SAS do not have any current or pending patent rights relating to the technology described in this contribution.**

[1] Arild Fuldseth, Michael Horowitz, Shilin Xu, Andrew Segall, Minhua Zhou, “Tiles”, JCT-VC document JCTVC-F335-v2, Torino, July, 2011.

[2] C. Gordon, F. Henry, S. Pateux, “Wavefront Parallel Processing for HEVC Encoding and Decoding”, JCT-VC document JCTVC-F274-v2, Torino, July, 2011.