

## Running MetroLER on Multiple Cores

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MetroLER has the ability to make use of multiple microprocessor cores. On the *Settings* tab, the user can select the number of processors to use simultaneously (in parallel) when batch processing images. The total number of processors available includes both physical cores and virtual cores (also called threads). Most Intel microprocessors can accommodate two threads per core, so that the number of available cores is generally twice the number of physical cores. These threads share memory and other processor functions, so running two threads on one core is not twice as fast as running one. To test the speed improvements that come with using multiple cores, the following two computers were tested.

Laptop:

Computer Processor: Intel i7-2637M @ 1.7 GHz (2 physical cores, 4 threads)

Memory (RAM): 4GB

OS: Windows 7, 64 bit operating system

Desktop:

Computer Processor: Intel i7-4770 @ 3.4 GHz (4 physical cores, 8 threads)

Memory (RAM): 32GB

OS: Windows 10, 64 bit operating system

MetroLER v1.1.6.4 was used to analyze line/space images that were 1024x960 pixels and contained 12 lines per image. Default MetroLER parameters were used. The results in the graph below show that the physical cores are very effective at running in parallel and thus speeding up the analysis of multiple images. On the desktop computer, setting MetroLER to use the 4 physical cores results in a 3.6x speedup, so that each core is about 90% effective. Each virtual core, however, is only about 30% effective, so that the use of 7 cores results in a 4.5x speed up.

