Optimization and Parallelization Methods for Radio-Network Planning

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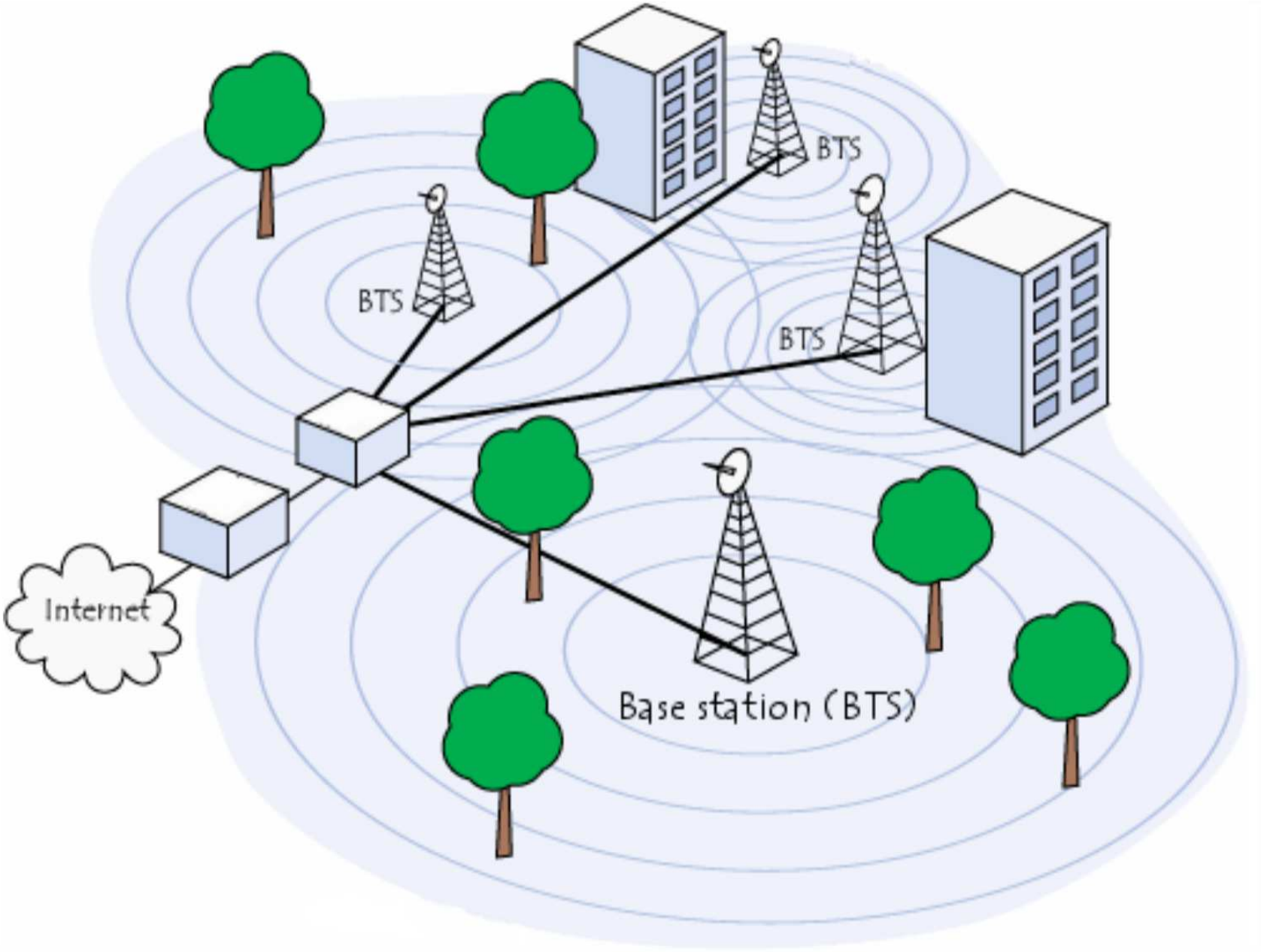
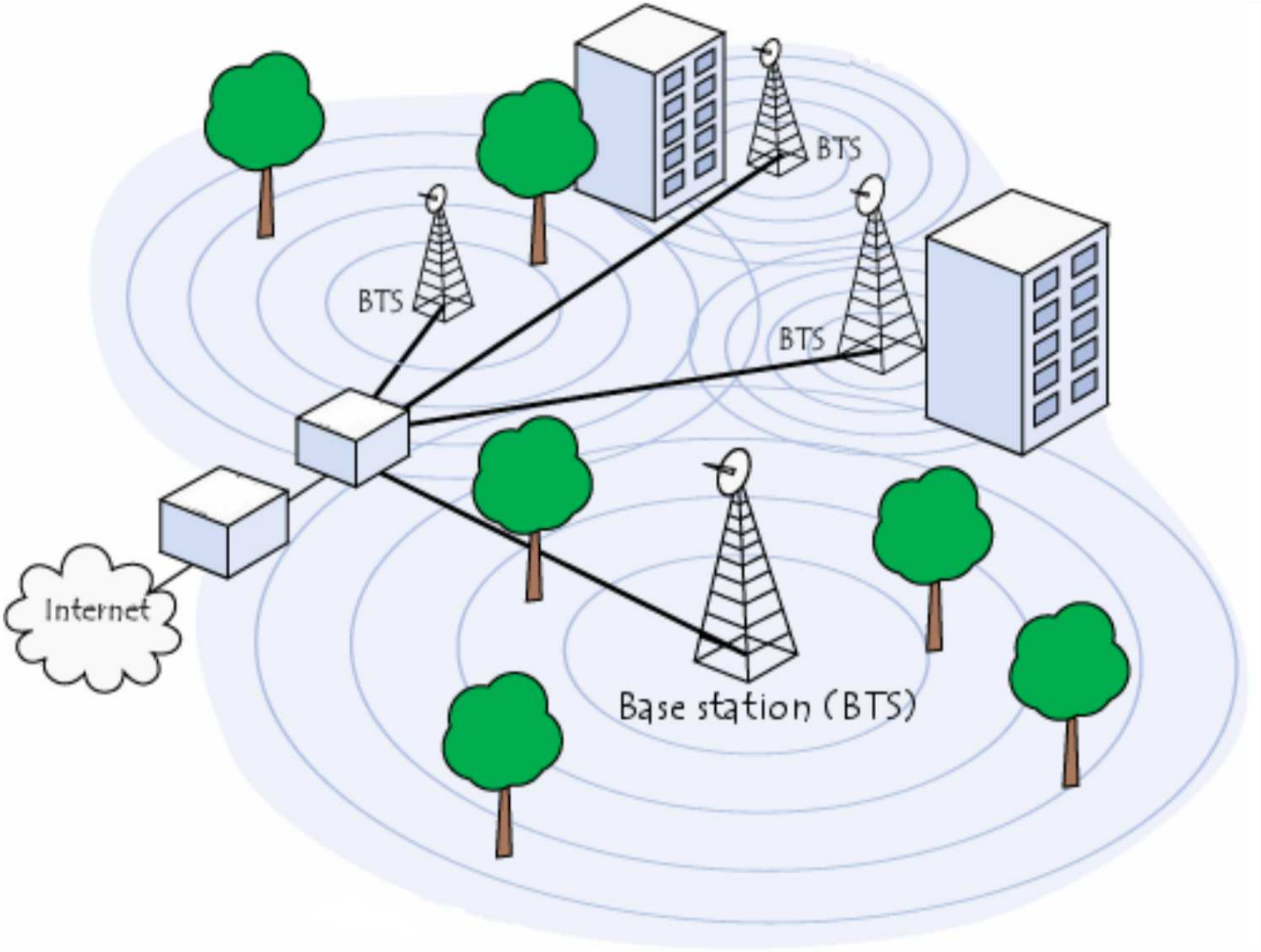
Radio network



Radio-network planning



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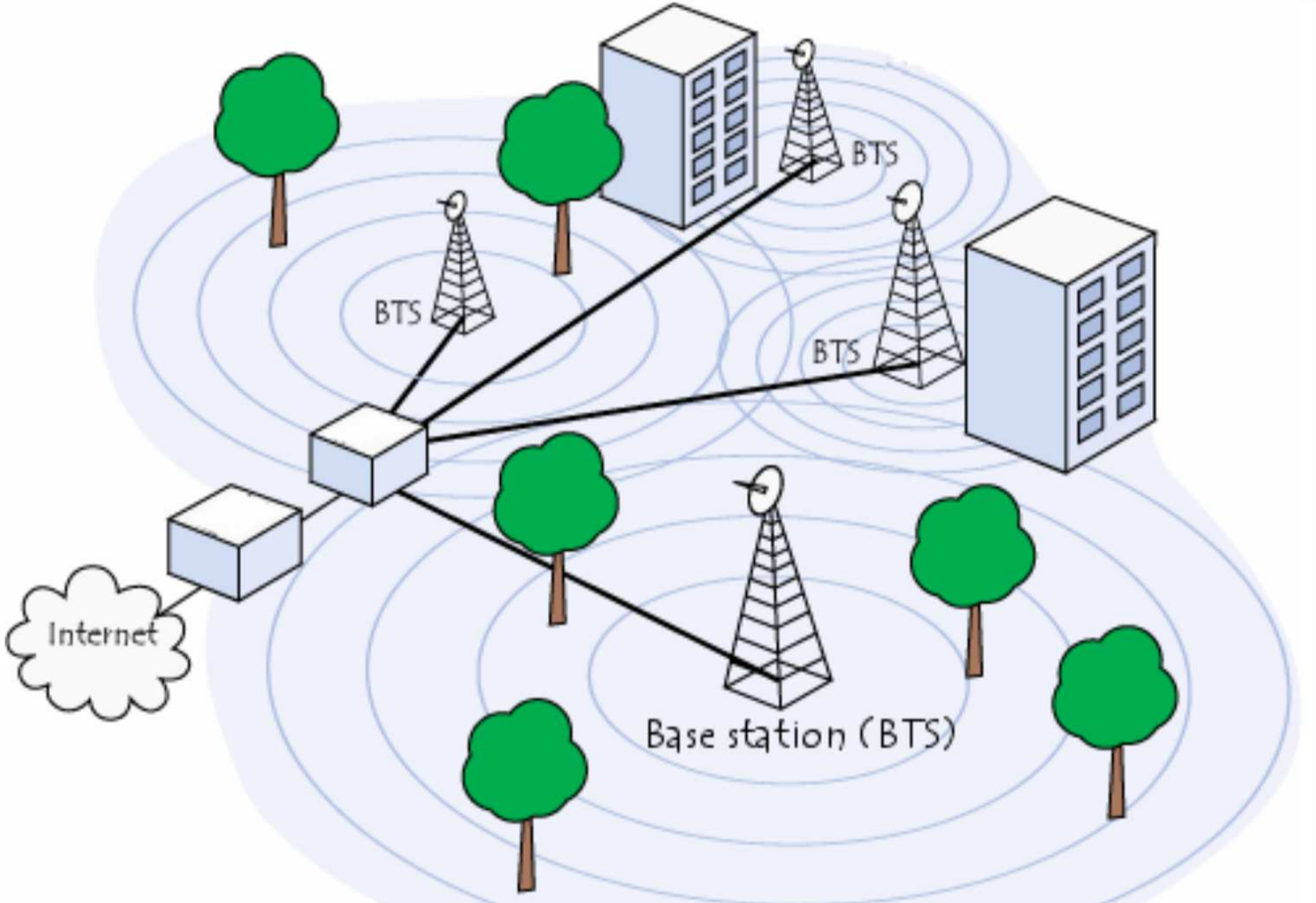
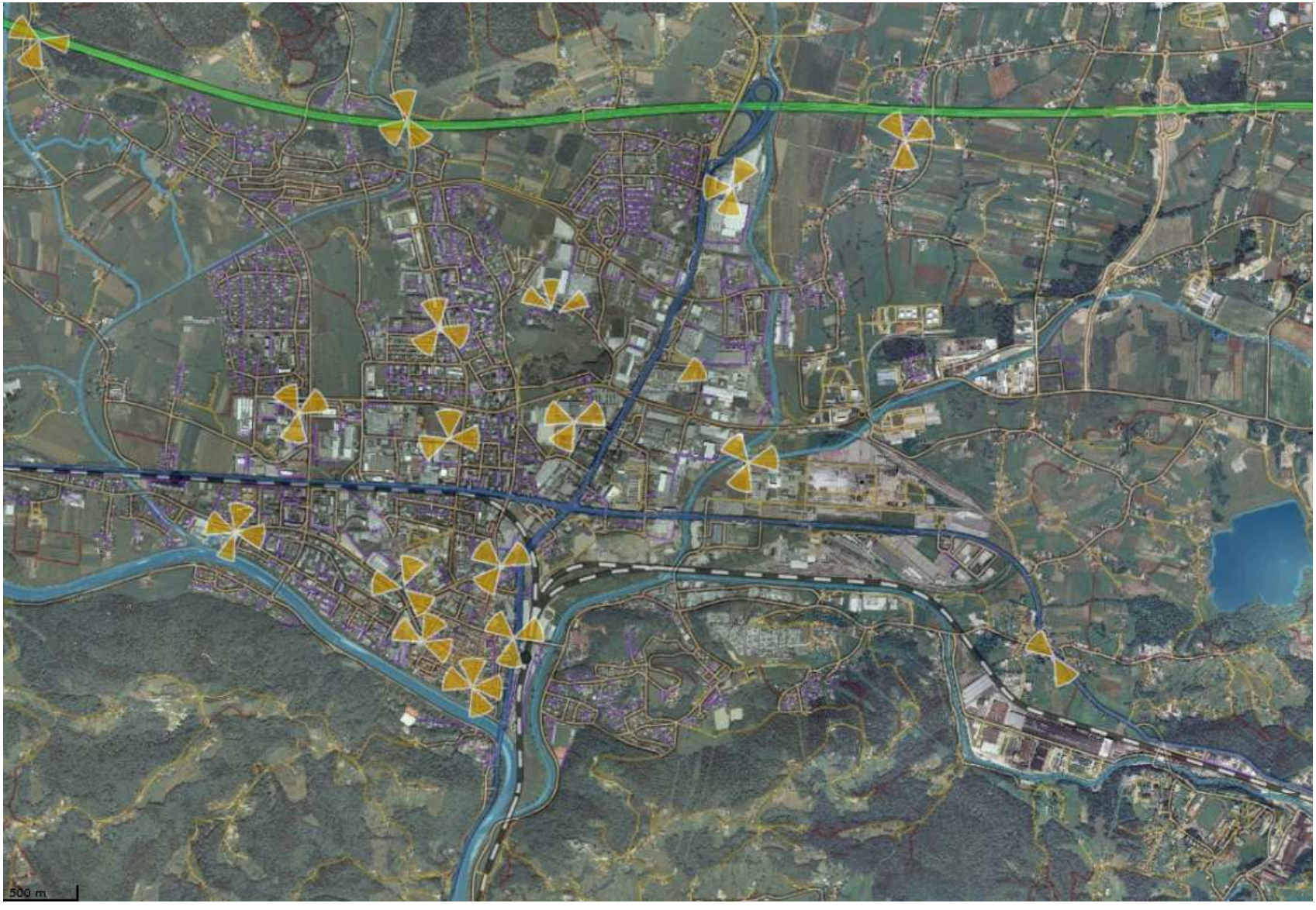


Radio-coverage optimization

Radio-network planning: coverage maps

Radio-network planning: coverage maps



Radio-network planning: coverage maps

Radio-network planning: state of the art

- Current optimization approaches are only effective for small networks (~10 BTS).
- Bigger networks only with lower problem complexity$\Longrightarrow$lower solution accuracy.
- The vast majority of works deals with "new networks".
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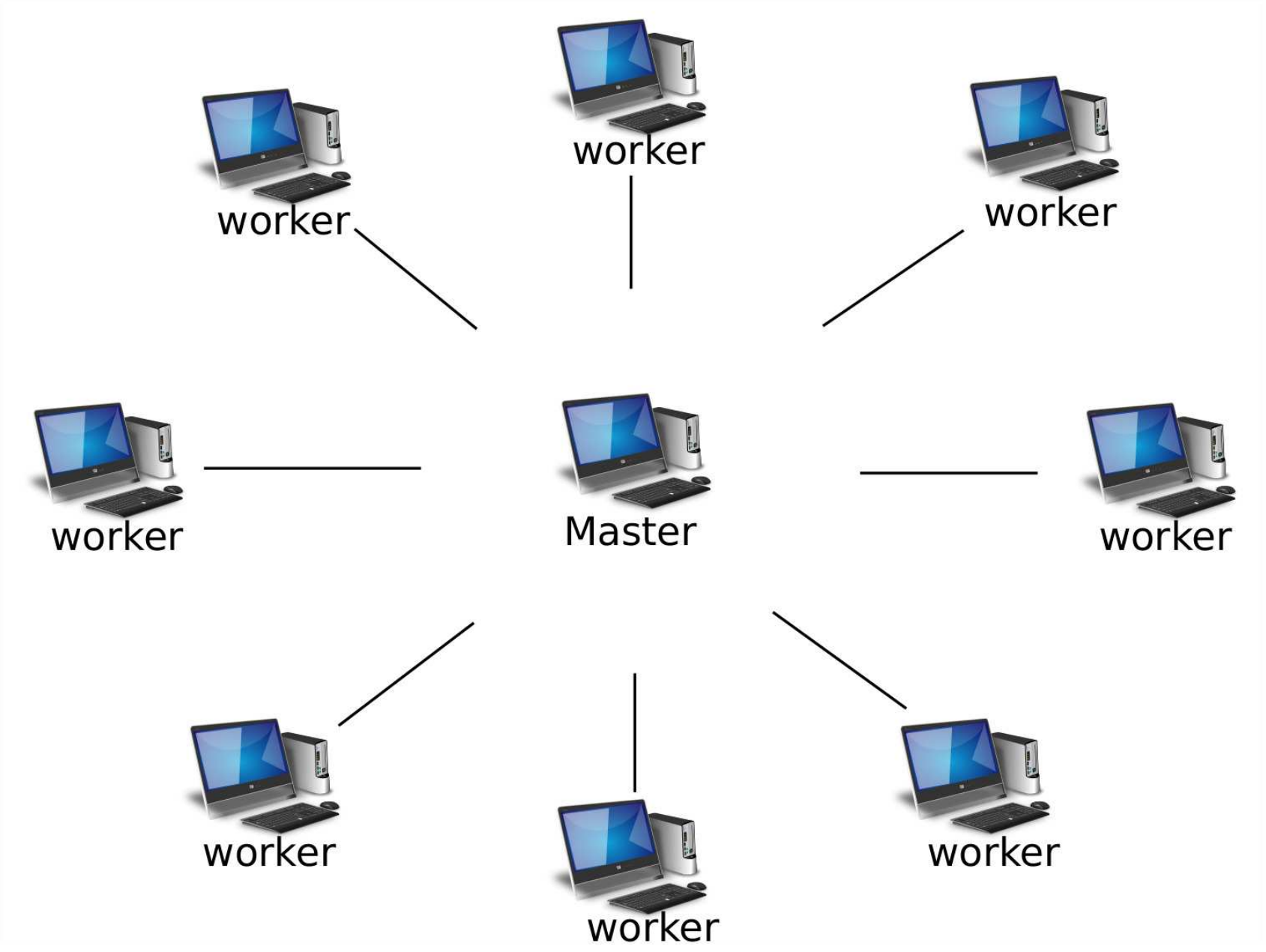
Simulation: coverage maps

Serial implementation

Parallel implementation

Parallel implementation - architecture



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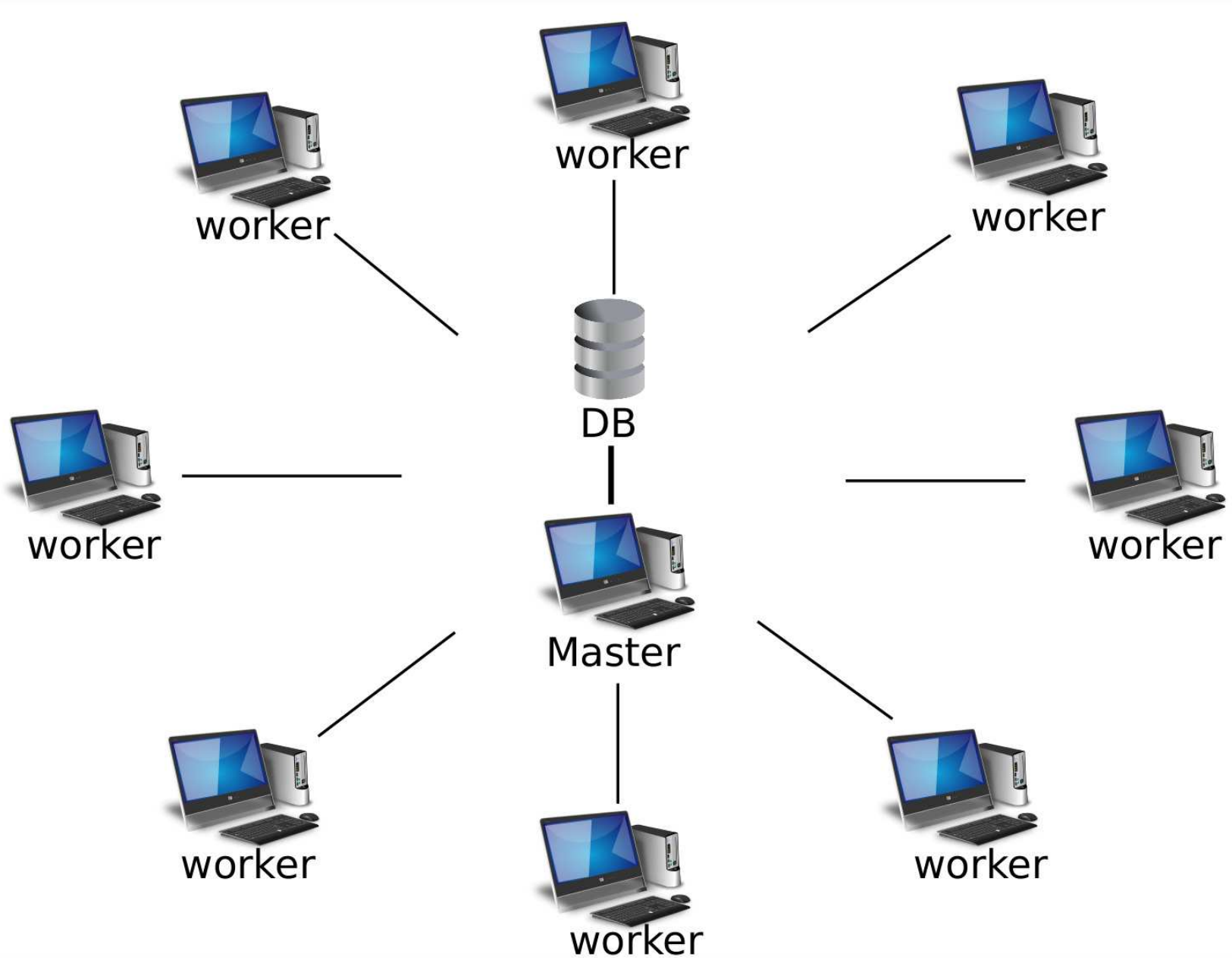
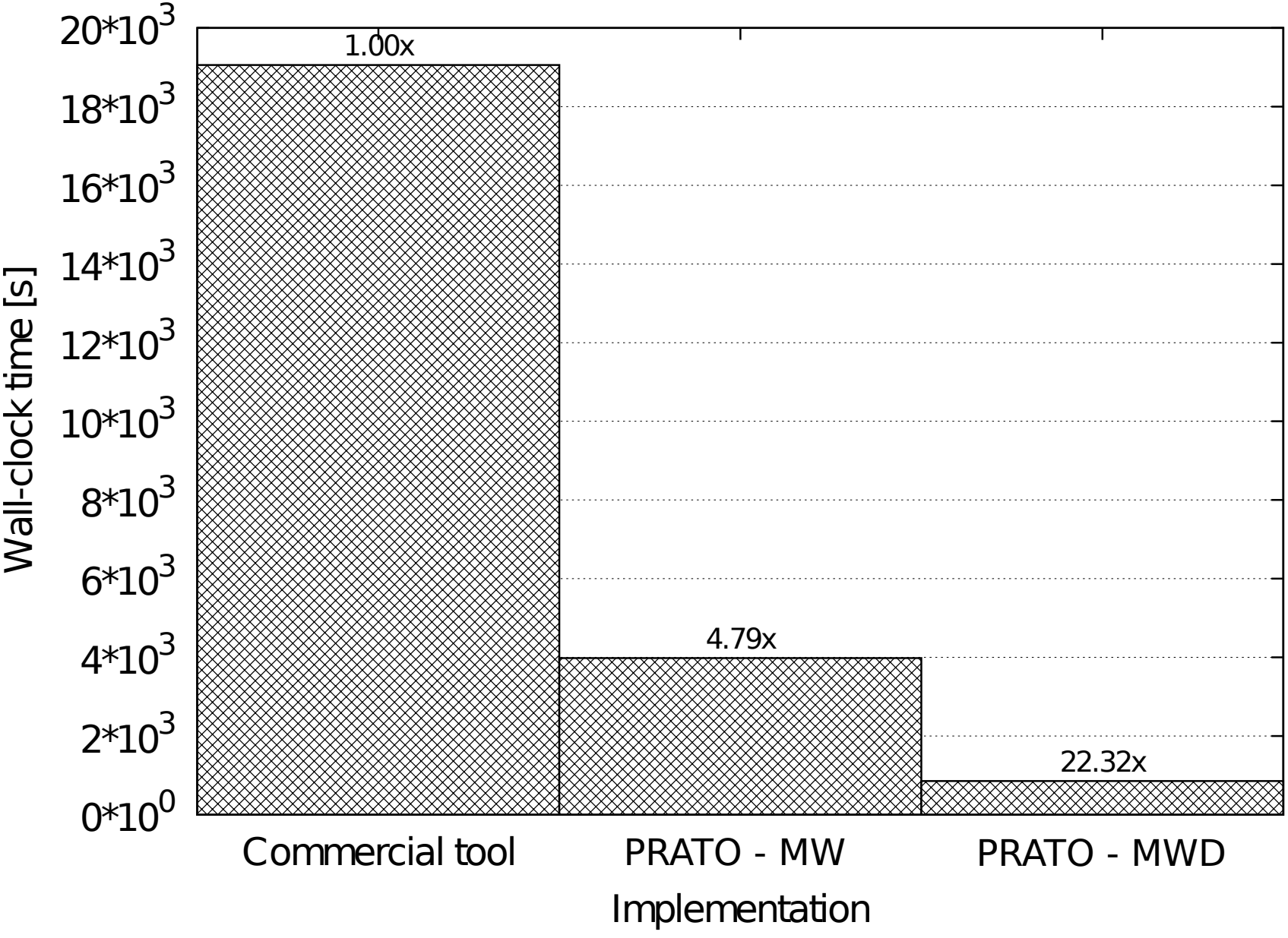


Parallel implementation - speedup



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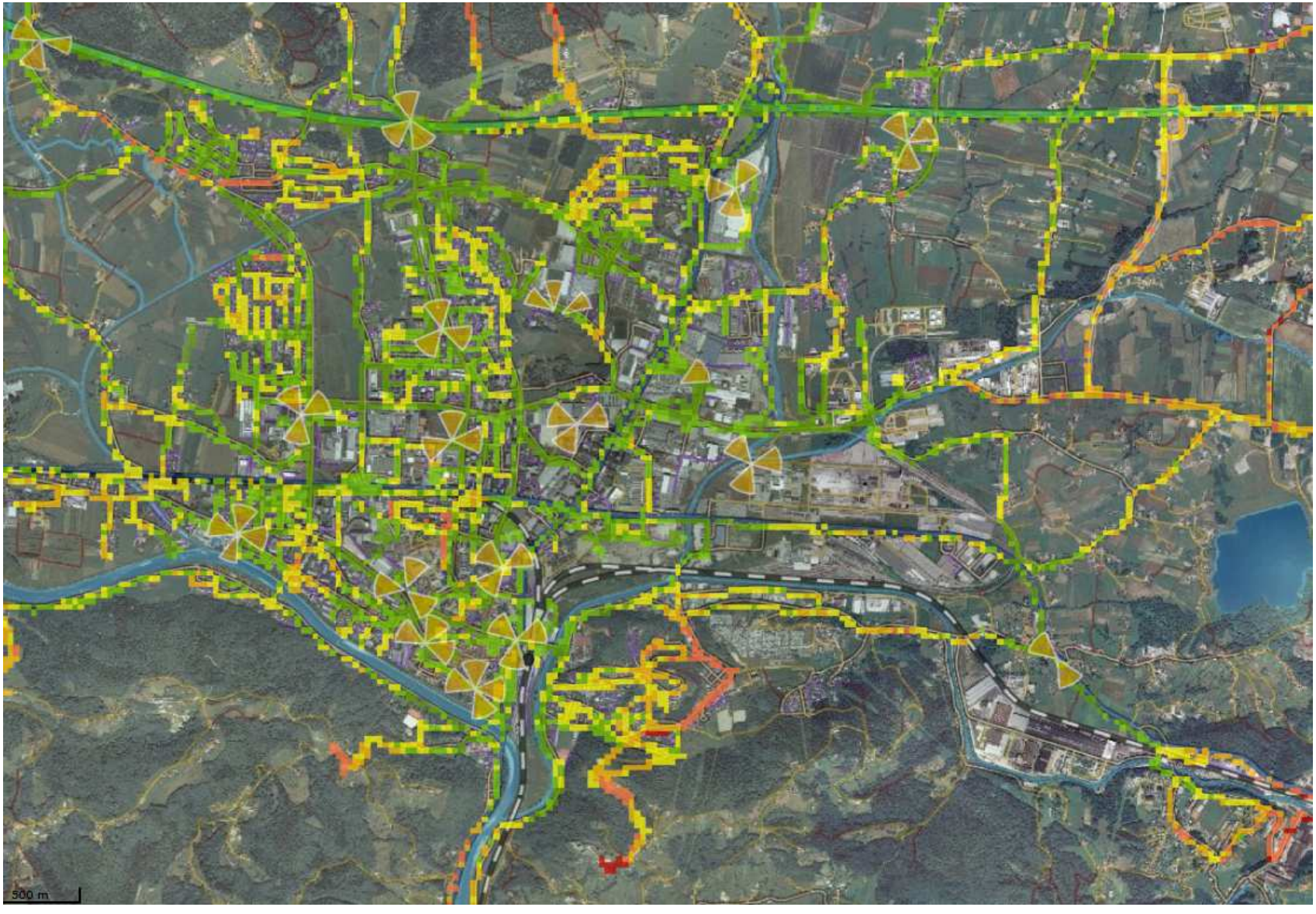

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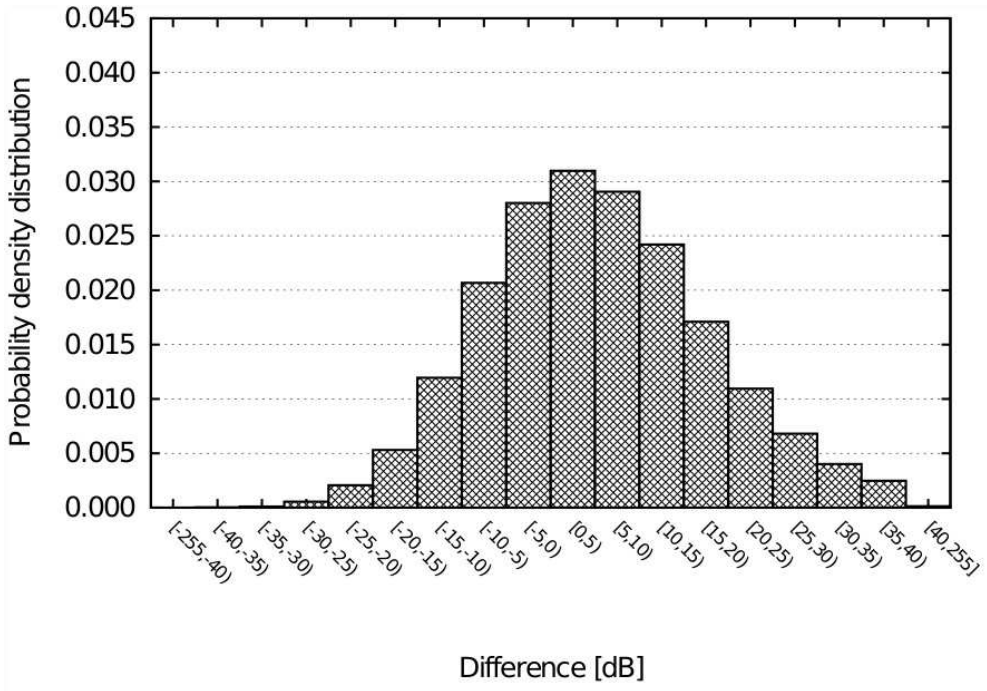

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Std.dev: 14.36 dB

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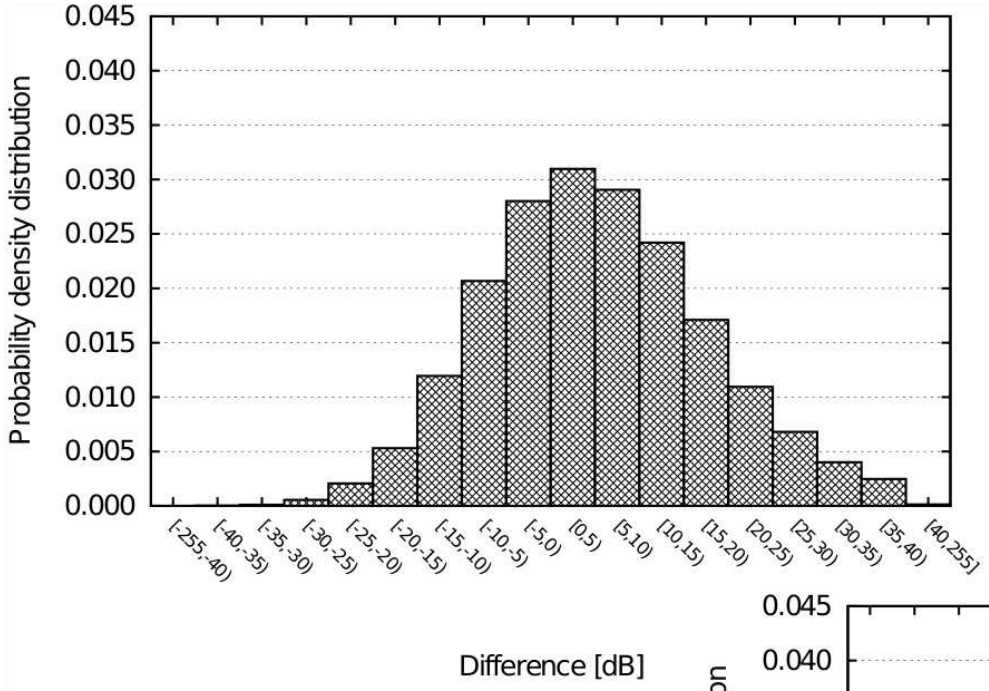

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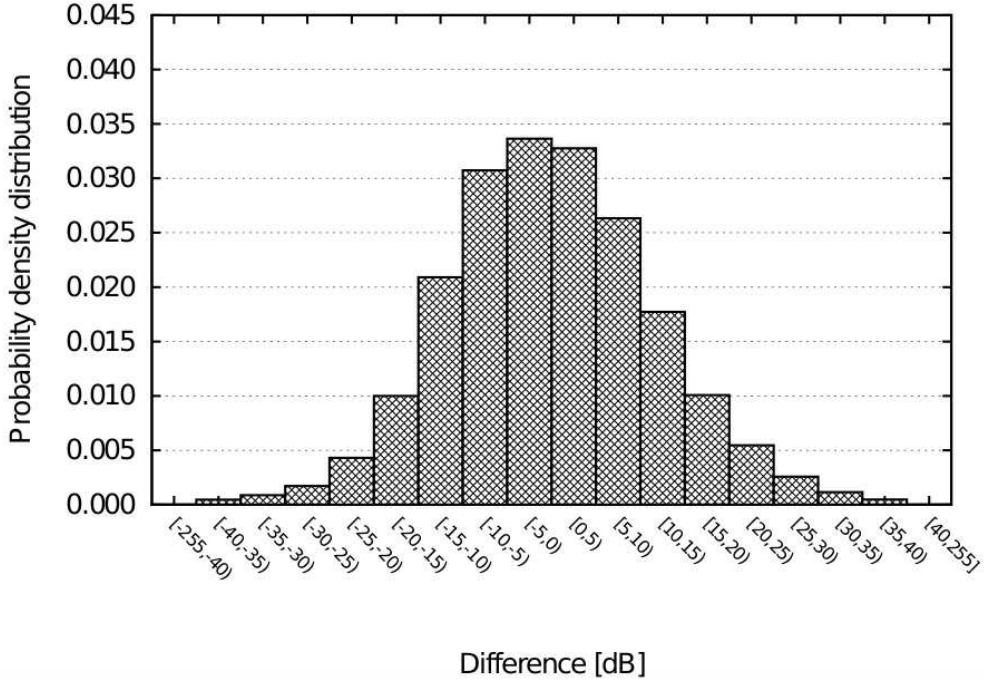
Mean: 0.01 dB
Std.dev: 11.99 dB



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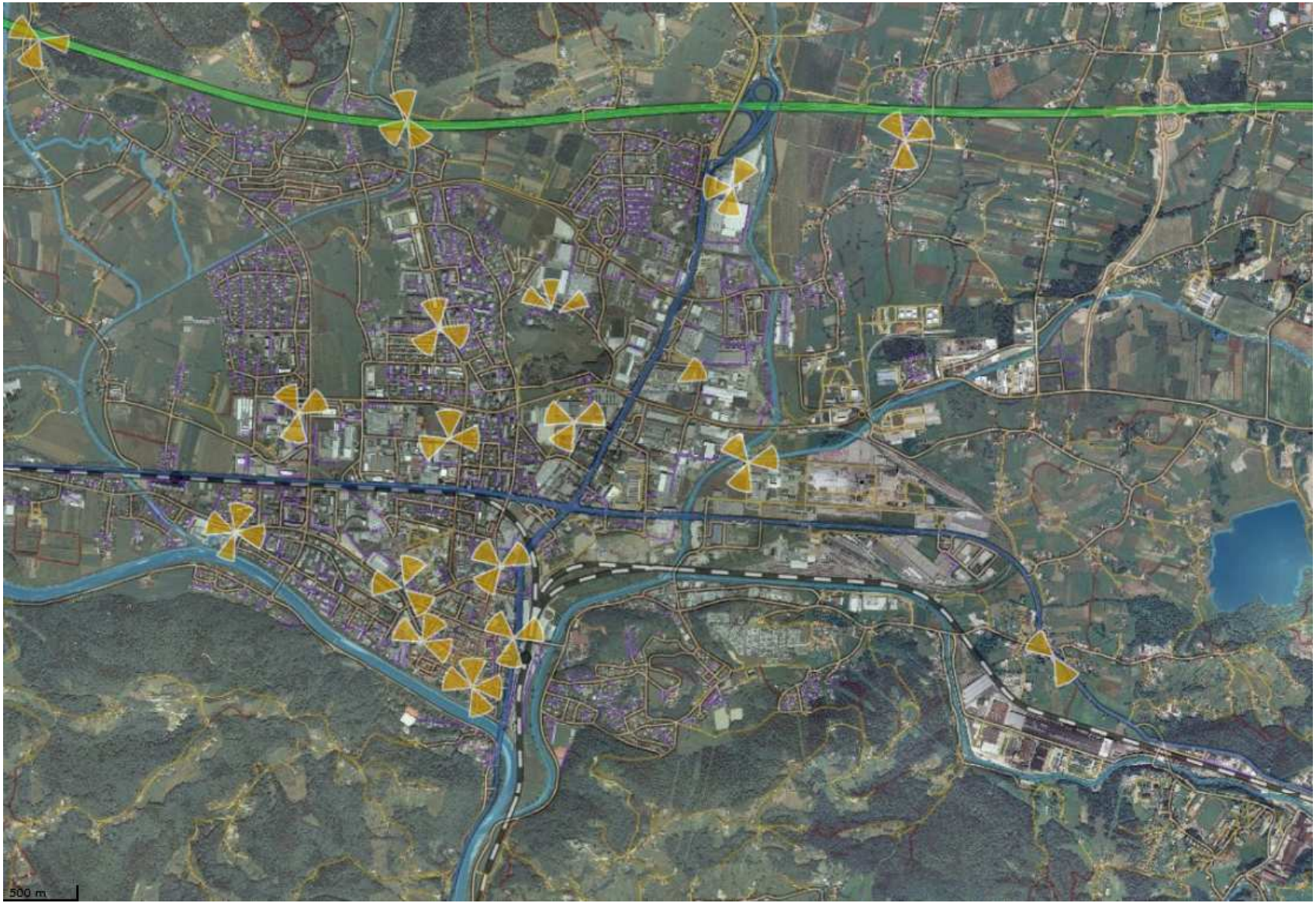
Fine tuning: minimum power



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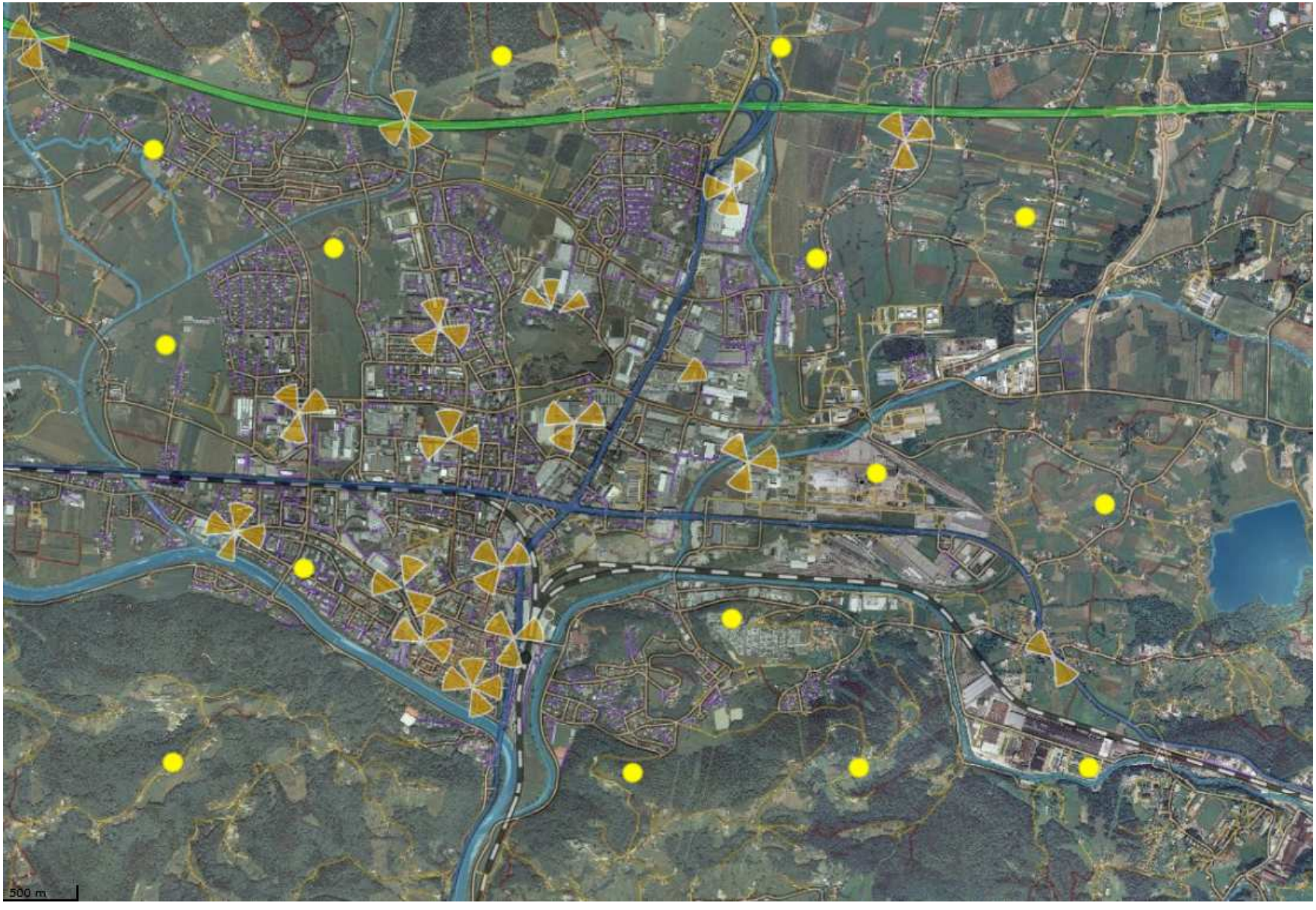

Fine tuning: minimum power

	No optimization		Siomina et al. (2008)		Multi-agent	
	Total power (W)	Average power (W)	Total power (W)	Average power (W)	Total power (W)	Average power (W)
Net_1	422	2.187	–	–	147	0.764
Net_2	345	2.331	115	0.778	112	0.757

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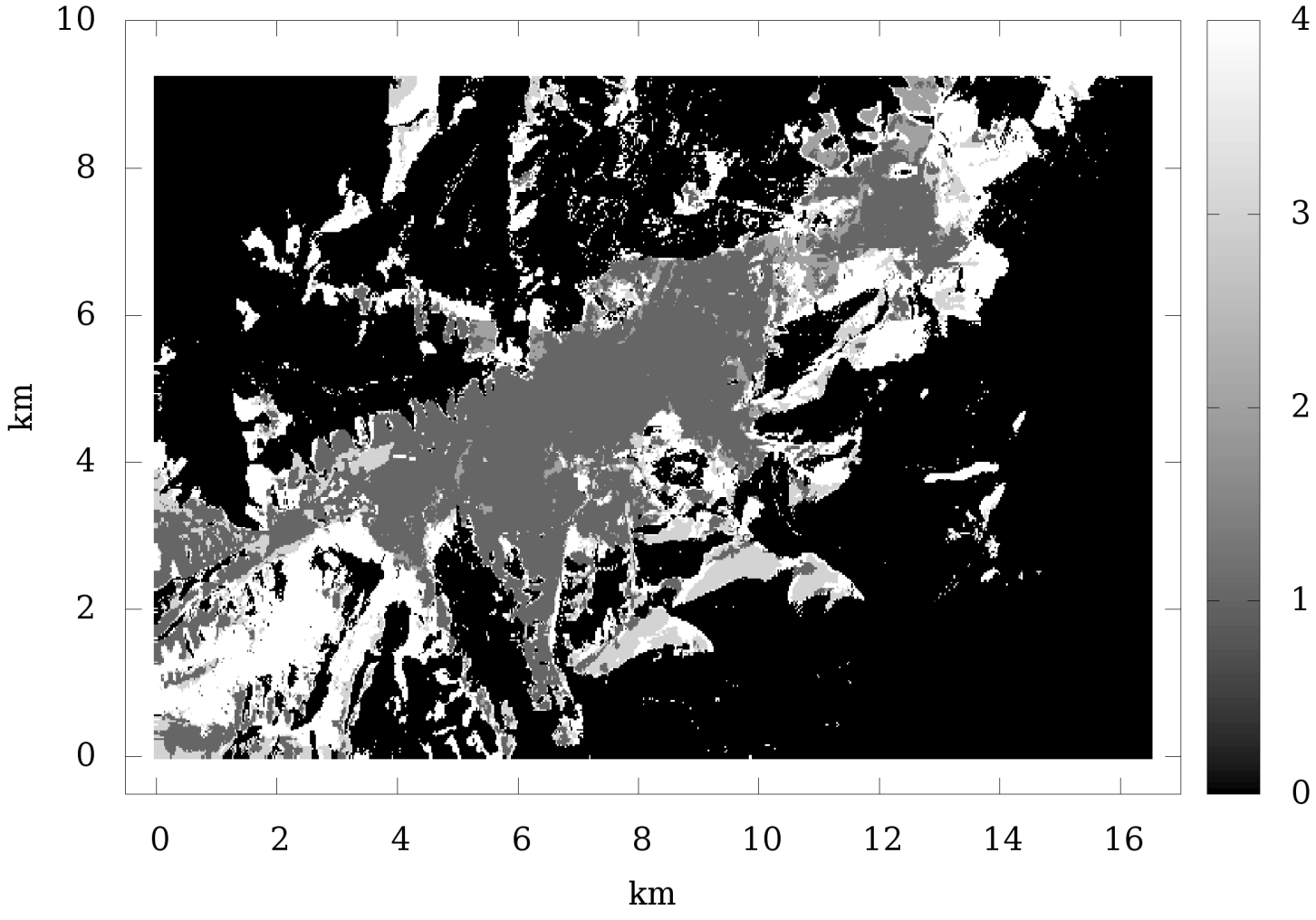

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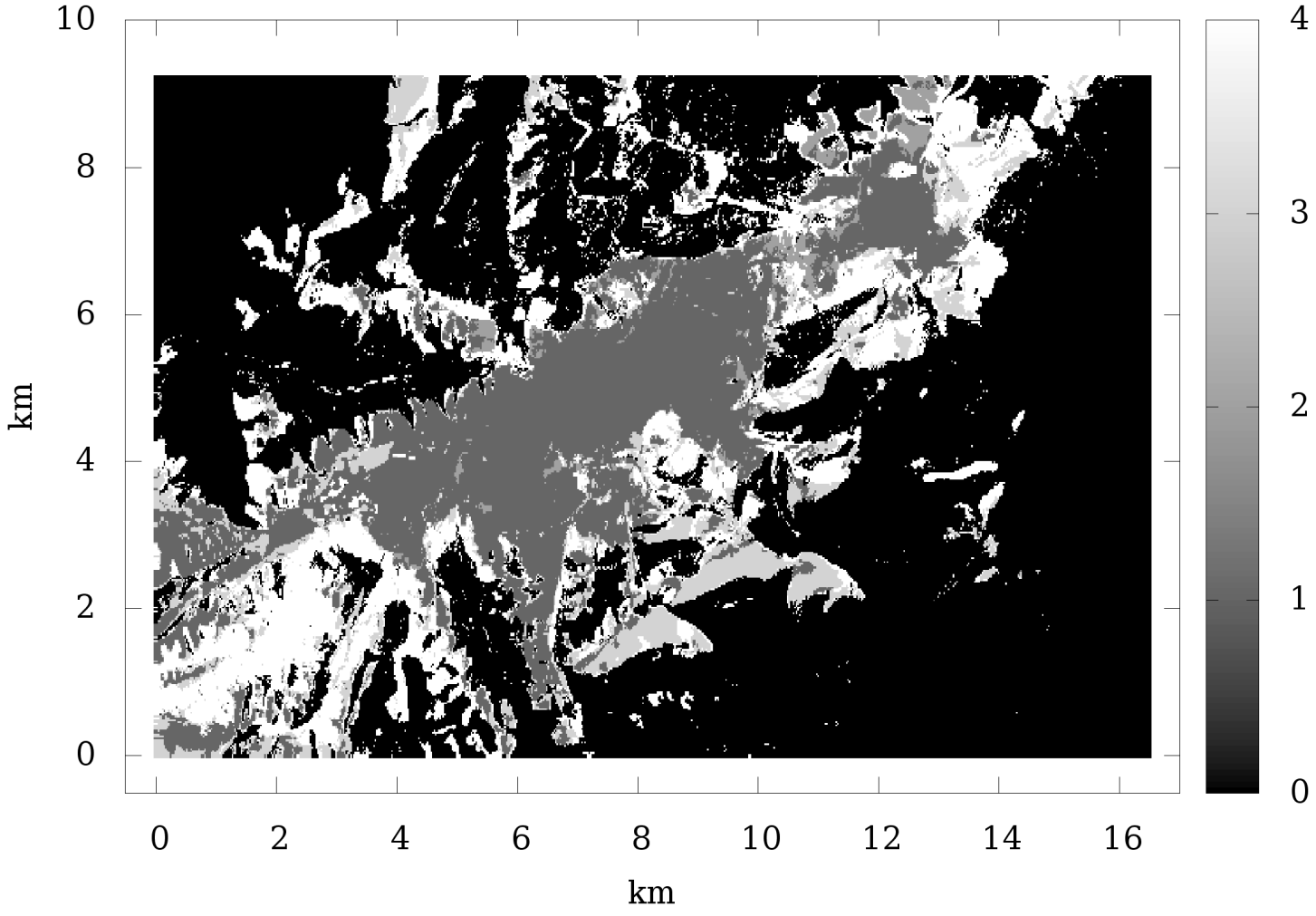

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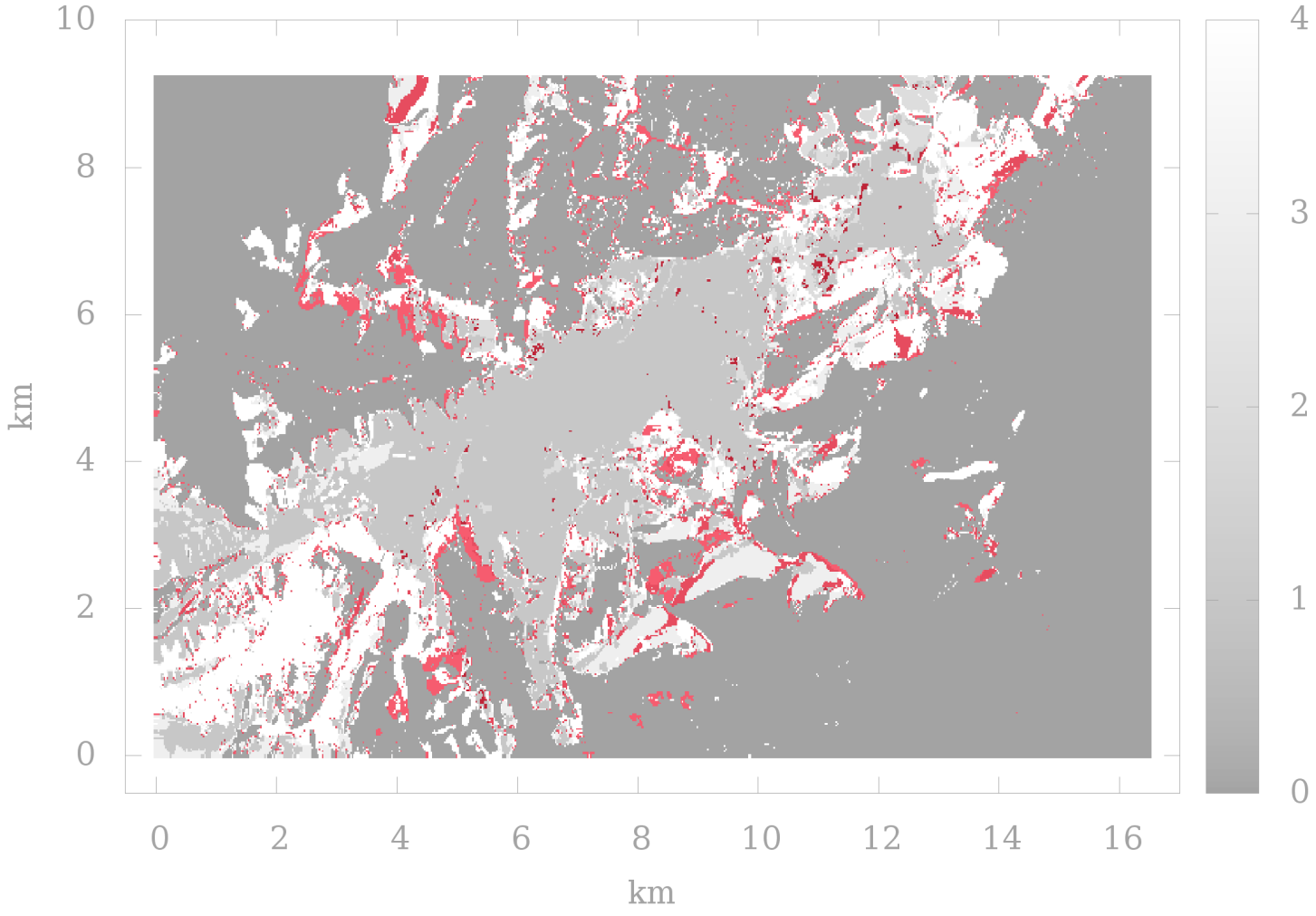

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