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Site-selection for next generation surface detectors

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Next generation surface-based gravitational wave detectors will have increased arm-length of up to 40 km. Due to the earth's curvature 30 m deep trenches or tunnels are required for a straight laser beam to reach the end-stations. Locations with minimal soil digging and filling could help reduce the construction cost. We use digital elevation data to find such optimal locations, in the USA, Canada and Australia for 20 km and 40 km long detectors. However, several physical and human geographical aspects have to be considered (e.g., geology, occupation of the land, local indigenous custodians and values, remoteness, etc) for the selection of a viable location.

Autore principale: SLAGMOLEN, Bram (The Australian National University)

Relatore: SLAGMOLEN, Bram (The Australian National University)

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