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Bipartiteness, planarity, and vertex sedentariness

A vertex in a quantum walk on a graph is said to be *sedentary* if the quantum state assigned on that vertex tends to stay at home. Sedentary vertices are thought to be useful in the development of quantum memory for quantum computers. In this talk, we discuss recent results on the theory of vertex sedentariness using elementary graph-, matrix- and number-theoretic tools. In particular, we highlight rarity-type results in bipartite and planar graphs. If time permits, then we also discuss vertex sedentariness in integral graphs. Most of this talk is derived from the paper entitled *Sedentary quantum walks on bipartite and planar graphs* (arxiv:2601.18964) to appear in the Canadian Journal of Mathematics in collaboration with Karen Meagher.