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Raymond Tennant* (raymond.tennant@psuad.ac.ae), Paris Sorbonne University Abu Dhabi, PO Box 38044, Al Reem Island, Abu Dhabi, United Arab Emirates. *Geometric Techniques in Medieval Islamic Art and Architecture: From Strapwork Ornamentation to Quasicrystal Constructions*. Preliminary report.

The Islamic world has a rich artistic tradition of creating highly geometric and symmetric art and architecture. Throughout the Middle Ages, artisans in collaboration with mathematicians developed geometric techniques for producing periodic tilings from the Middle East and Central Asia to North Africa and Andalusia in Spain. Other historic architecture from the same period contains more intriguing non-periodic patterns that possess pentagonal quasicrystal symmetry similar to that of Penrose tiles. Early 10th Century writings like the *Subtlety of Geometric Figures* by philosopher Abu Nasr al-Farabi and *Geometry Needed by Craftsmen* by Khorasan mathematician Abu l-Wafa describe some construction methods of these medieval artisans. Later historic manuscripts like the 15th Century Topkapi Scroll provide insight into how other intricate designs might have been produced. In addition to historic writings, this paper looks at evidence from surviving medieval architecture to understand the symmetry of these patterns. Straightedge and compass constructions of regular shapes as well as approximations of non-constructible figures like regular 7-sided and 9-sided stars are investigated to further understand how the artisans achieved their aesthetic results. (Received September 18, 2015)