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MINIMUM COVERS FOR ARCS OF CONSTANT LENGTH

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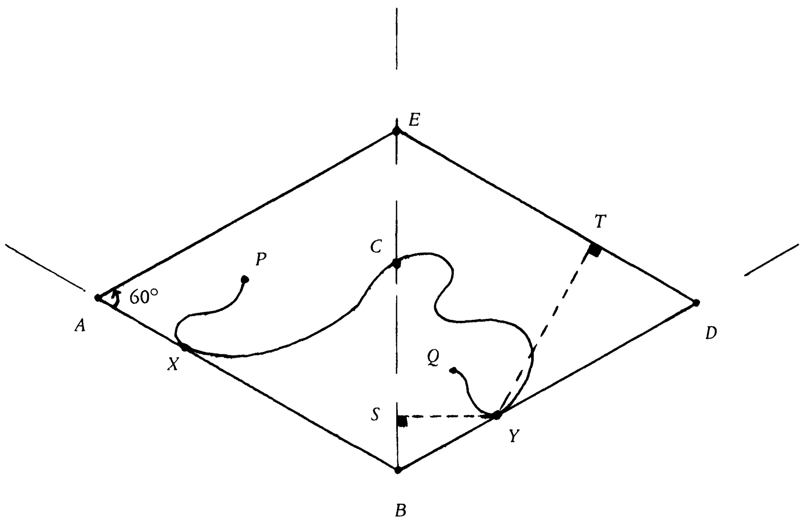
Recently Gerriets [**1**] showed that a certain convex closed region with area less than $0.3214L^2$ covers any arc of length L. This is an improvement to Wetzel's results [**3**] on the famous and elusive "Worm Problem" of Leo Moser [**2**]: What is the (convex) region of smallest area which will accommodate every arc of length L? Wetzel showed that a certain truncated sector with area less than $0.34423L^2$ covers all arcs of length L. By slightly modifying the region considered by Gerriets, we obtain a region with area less than $0.2887L^2$ which covers any arc of length L.

THEOREM. *The closed region whose boundary is a rhombus with major diagonal L and minor diagonal $L/3^{1/2}$ covers any arc of length L.*

Herein we give a sketch of the proof. Details and other results will appear elsewhere. Let PQ denote an arc of length L and with center C whose two subarcs are PC and CQ. "Slide" the arc PQ along BE toward B so that C is always incident with BE and PQ becomes "tangent" to AB or BD (see the figure below) at the points X or Y. It is possible that all such



orientations of PQ by rotation allow only one of the arcs PC or CQ to be

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