An analysis of a collision situation in polar coordinates

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Avoiding collisions with other vessels and natural or artificial navigational obstructions is an important element
of navigation safety. This problem is automatically solved in anti-collision ARPA systems, or geometrically as
radar plots. In both cases we use radar measurements: bearing (or relative bearing) on the target position and
distance, both naturally localized in the polar coordinates system with the origin at the radar antenna. We convert
original measurements to an ortho-Cartesian coordinate system. Then we solve a collision avoiding problem in the
new system, and then transform the results to the polar coordinate system. This article presents a method for an
analysis of a collision situation performed directly in the polar coordinate system. This approach enables a simpler
geometric interpretation of a collision situation.