The SI should not ignore the directional nature of vector quantities

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One of the shortcomings of the International System of Quantities (ISQ) and the International System of Units (SI) is their deliberate restriction to scalar quantities and their units. All their kinds-of-quantities are treated as scalar, yet very many of them are vectors. Their scalar parts can be of the same kind only if the vectors are parallel or coincident. A vector is not completely specified until its direction is stated; the directional part of a vector may be specified as an *angle* in relation to an arbitrarily chosen datum and sign. An easterly direction is plus one right angle in the clockwise direction from north, or it is a compass direction of plus 90 degrees. However, the ISQ and the SI have usurped the name and term *angle* for use as a name for a trigonometric function. They have no name for an angle in its universal sense of a difference of direction.

Examples of vectors are length, velocity, force, moment, electric current, momentum, mass flux, heat flux, temperature gradient, concentration gradient or any kind of intensive-quantity gradient. Calling a velocity a ‘speed’ does not turn it into a scalar quantity; it merely asserts that the velocity’s nature as a vector is to be be ignored and only its scalar value is of interest. An example is equating the scalar value of a centripetal force to the product of a scalar momentum (that is mass times speed) divided by time.

A height is obviously not the same kind of quantity as a horizontal distance, even if their scalar parts are equal.

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