

## The effect of parallel steering of a four-wheel drive and fourwheel steer electric vehicle during spinning condition: a numerical simulation

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### ABSTRACT

X-by-wire technology is an advancement in automotive industry and is recognized by many countries in recent years. The in-wheel motor system is a type of drive-by-wire technology and it will be the main focused for the vehicle model in this paper. The steer-by-wire is a kind of by-wire technology in the automotive industry for the electric vehicle. [1] Steer-by-wire technology can be divided into two types which are two-wheel steering (2WS) and four-wheel steering (4WS). As we know, 2WS system is used in most of the vehicles.[2] However, the lower maneuverability will be shown in this type of vehicle during the vehicle spinning. The dynamic equation of motion was used for the simulation of vehicle movement.[3] The software of MATLAB Simulink was used to imitate that the effect of 4WD and 4WS EV during cornering.[4,5] The passive control was used in this simulation. As the result, the simulation indicated that 2WS EV is easy oversteered. After applied 4WS system, the vehicle oversteer problem was successfully solved by use parallel steering mode.

### KEYWORDS:

Automobile steering equipment; Automotive industry; Electric vehicles; Equations of motio