In this paper, a new analytical model (GCH) which takes into account the yaw added wake recovery and the secondary wake steering effects is proposed to predict the wind farm power production under active yaw control. Overall, it is an interesting and promising piece of work. Nevertheless, the equations in this paper are in a mess. Some are wrong. Some are given without rigorous theoretical justification. These issues bother the reviewer a lot and have to be fixed prior to publication. Detailed comments are as follows:

Major issues

1. Equations (11)-(18) are incorrect. Take equation (11) as an example. The induced spanwise velocity (V) should be related to the vertical distance to the vortex center (z-z_h), instead of the spanwise distance (y-y_0). The correct form is:

$$V_{wake\ rotation} = \frac{-\Gamma_{wr}(z-z_h)}{2\pi[(y-y_0)^2+(z-z_h)^2]}(.....)$$

2. Substituting equation (4) into equation (3), we obtain $M_0=C_T$. Why introduce two symbols to represent the thrust coefficient?

3. In equation (6), the physical meaning of u_0 is the wake velocity at the onset of far wake, instead of *"the velocity behind the rotor"* given by the authors.

4. Equation (9) is different from that in Bastankhah and Porte-Agel (2016). The authors changed the original term $1.6\sqrt{\frac{\sigma_y\sigma_z}{d^2\cos\gamma}}$ to $1.6\sqrt{\frac{\sigma_y\sigma_z}{\sigma_{y0}\sigma_{z0}}}$. This doesn't hold, as $\sigma_{y0}\sigma_{z0} \neq d^2\cos\gamma$. In fact, they differ approximately by a factor of 10.

5. In section 2.3, the authors conjectured a new effect called *"added wake recovery due to yaw misalignment"*, and stated "*the wake recovers more when the turbine is operating in misaligned conditions…*". In order to make such a statement, the authors should provide some quantitative evidences, or at least give a reference. Additionally, if this effect does exist, instead of using a complex equation (equation (23)), why not just increase the wake recovery rate k_y.?

6. Equation (23) is given without rigorous theoretical derivation, which is unacceptable to the reviewer. What is the exact control volume used to apply momentum conservation? Why

an artificial parameter α_r is introduced? Detailed theoretical derivations should be given in the appendix.

7. In section 2.3.1, instead of computing the effective yaw angle based on equation (24), why not directly use the ratio of total transverse velocity to freestream velocity to estimate γ_{eff}?
8. The figures in this paper, are not well presented. Labels are hardly recognizable and the information in figures 2, 12, 13 and 14 can't be grasped at first sight.

Typos

1. Line 22 on page 3: *sigma*$_z$.