The updated version of "Comparison of OCO-2 target observations to MUCCnet - Is it possible to capture urban X_{CO2} gradients from space?" by Riessmann, et al., is much improved over the original (already quite good) manuscript. After addressing the two minor comments below, it will be ready for publication.

Figure 3 Caption must describe the 0.02x0.02 degree gridding scheme that is used to present the OCO-2 data.

Lines 154-158, regarding the AK Correction. "AK" in your equation (3) appears to be the 20x20 CO2 averaging kernel matrix, which is not available in the lite files. It appears you used the AK term for XCO2 (a vector, not a matrix, and which I typically call "a"), which if you did it that way is actually wrong. That this is a matrix is clearly stated in O'Dell et al. (2012) right after the equation is introduced. Rather than using the "C" profile quantities, you may wish to put the equation in XCO2 form for simplicity, and which does not require the full AK matrix. The proper AK equation in XCO2 form is as follows, and actually can be written three different ways:

XCO2_ak = Sum{i=1..nlev} h_i a_i u_mod,i + h_i (1-a_i) u_ap,i + [h_i u_mod,i – h_i, u_mod,i]
= XCO2_mod + Sum{i=1..nlev} h_i (1-a_i) (u_ap,i – u_mod,i)
= XCO2_ap + Sum{i=1..nlev} h_i a_i (u_mod,i – u_ap,i)

where "u" are profile co2 mole fractions, "ap" means the retrieve a priori, "mod" means model, "h" is the pressure weighting function vector, and "a" is the normalized averaging kernel vector for XCO2 (with values typically ranging from 0 – 1.5) . Both forms of the equation are easily derived from your equation (3), where "AK" from equation (3) is the full averaging kernel *matrix* (not vector!). "h" and "a" are both quantities available in the OCO-2 lite files. The middle form of the AK correction equation above shows that the correction only modifies the "pressure-weighted" XCO2 from the model if some levels have "a" significantly different than unity, and the apriori value is significantly different from the model value for those same levels. The third form of the equation was given in Connor et al. (2008, https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2006JD008336), as his equation (15).