

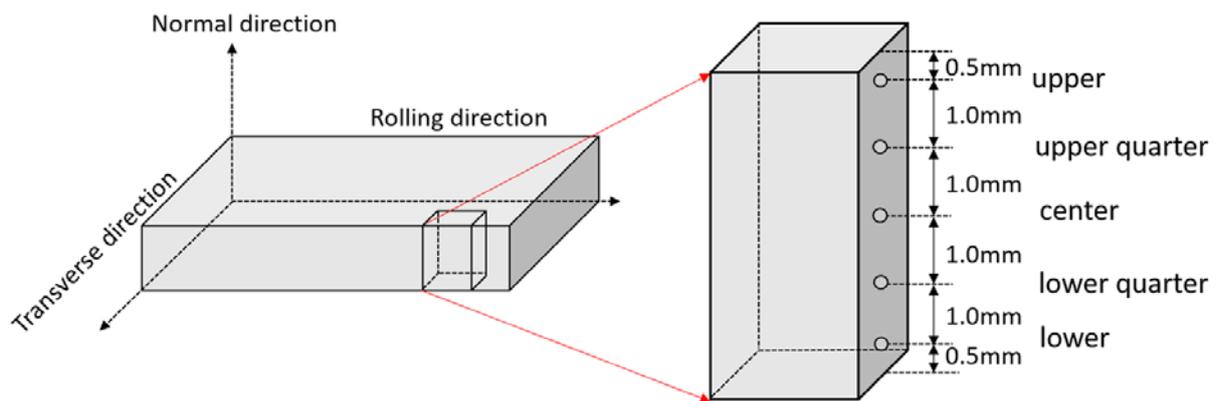
# Evolution of microstructure and mechanical properties of Mg-6Al alloy processed by differential speed rolling upon post-annealing treatment

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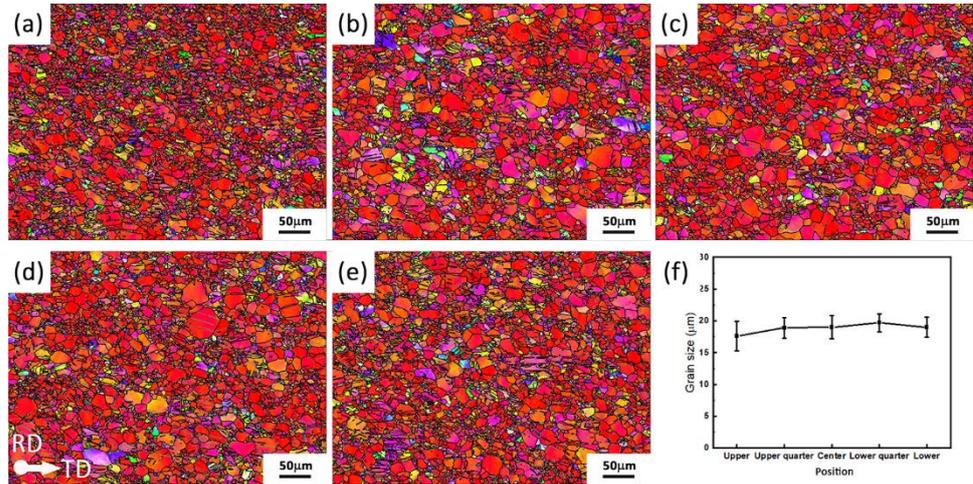
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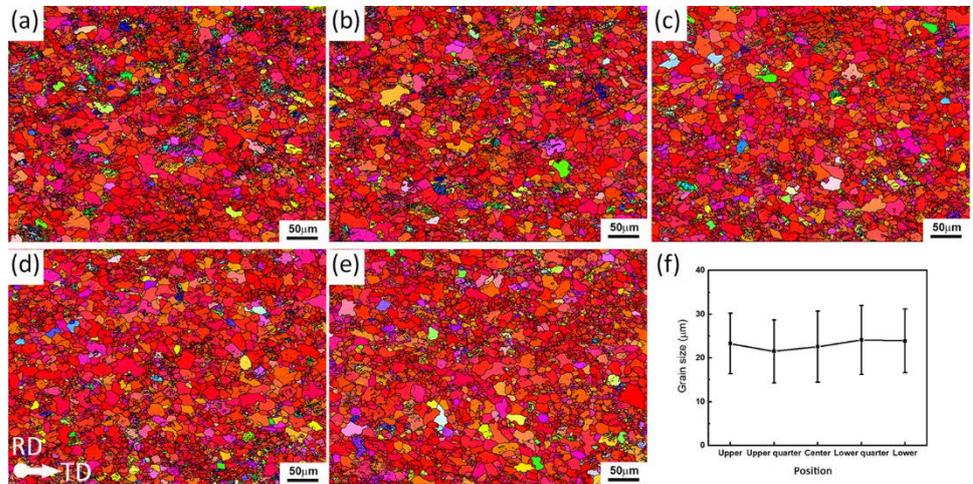


**Figure S1.** A schematic showing the five (5) different positions for EBSD analysis through the thickness of a plate.

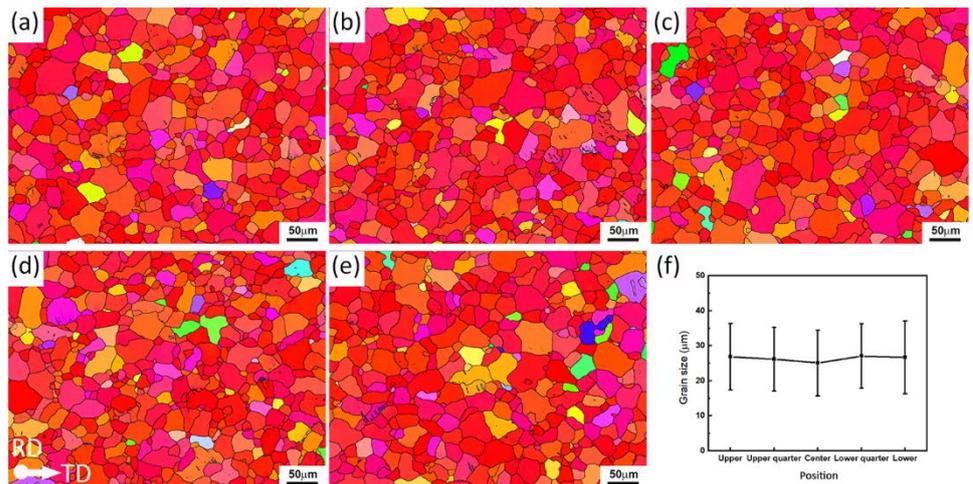


**Figure S2.** Inverse pole figure maps on the RD plane of the as-rolled plate at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the average grain size at these positions.

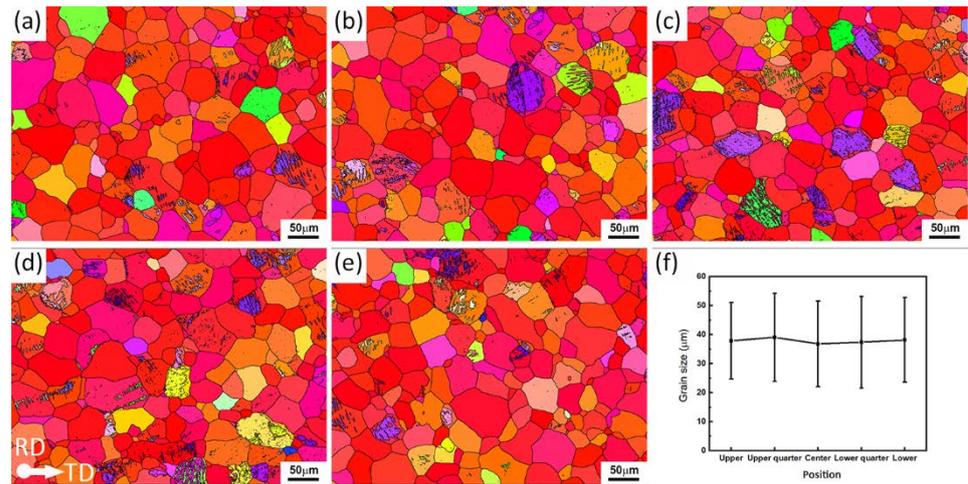
Note: although the IPF maps represent the grain morphologies in the RD plane, the orientation information (color) is taken from the IPF-Y direction which aligns with the ND. This was done to be consistent with the convention in the manuscript. All of the remaining IPF maps are constructed in this way.



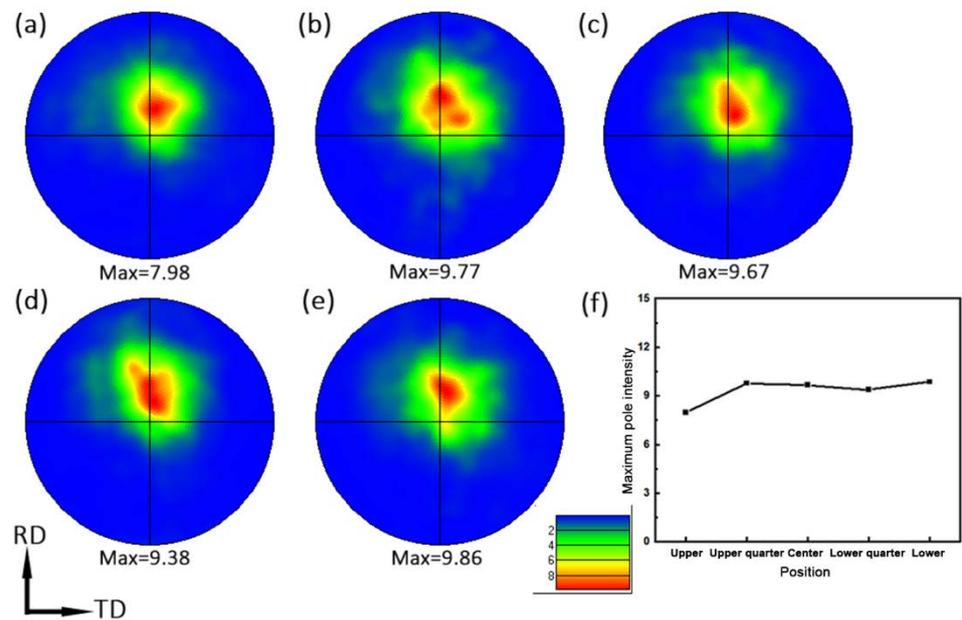
**Figure S3.** Inverse pole figure maps on the RD plane of the annealed plate (250°C) at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the average grain size at these positions.



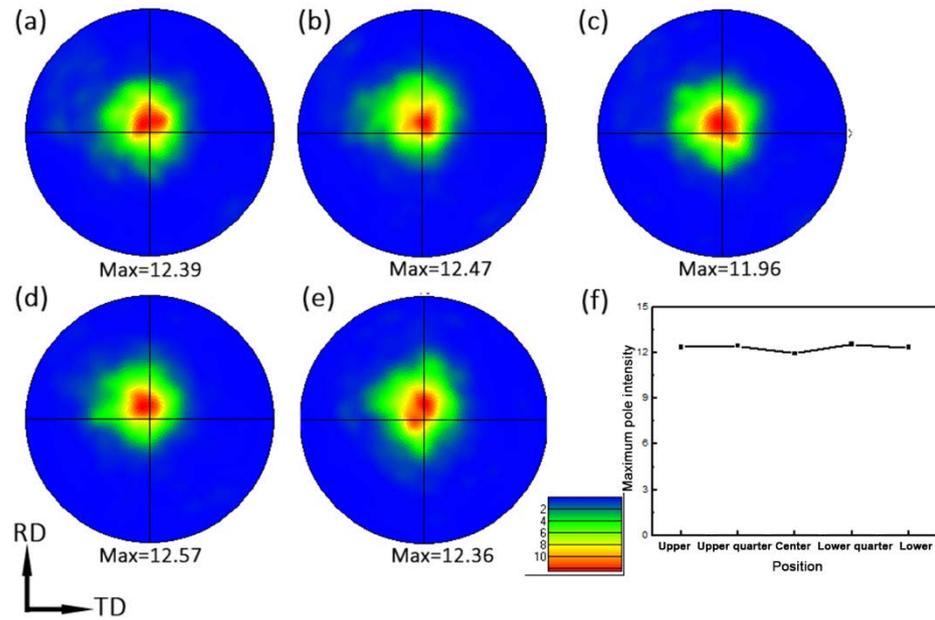
**Figure S4.** Inverse pole figure maps on the RD plane of the annealed plate (275°C) at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the average grain size at these positions.



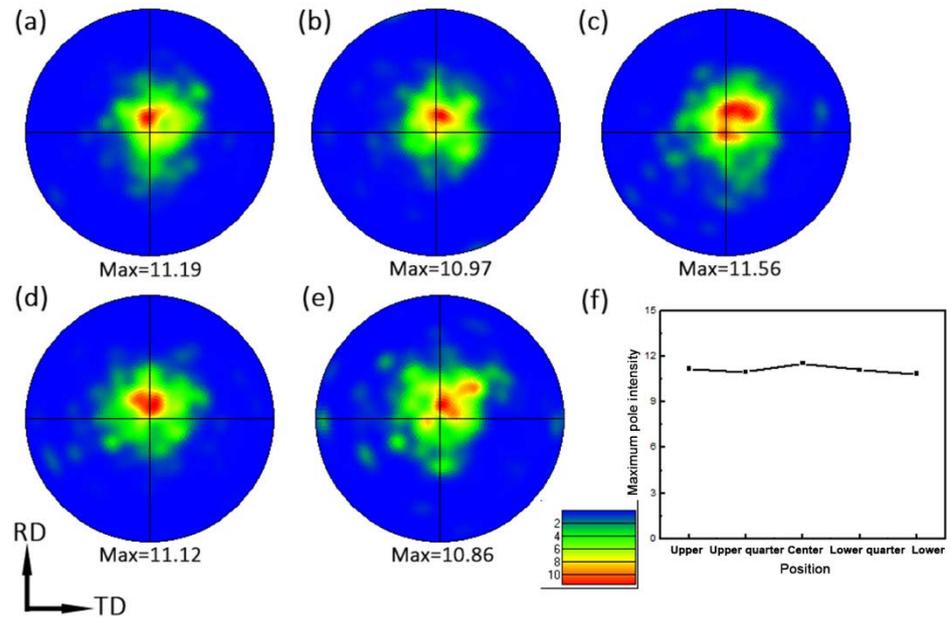
**Figure S5.** Inverse pole figure maps on the RD plane of the annealed plate (300°C) at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the average grain size at these positions.



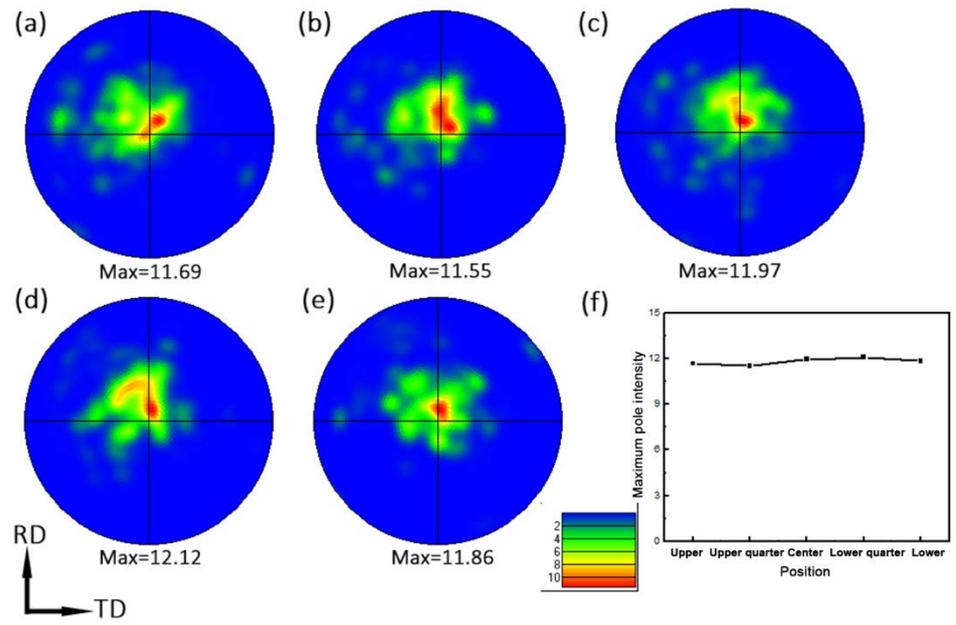
**Figure S6.** {0001} pole figures of the as-rolled plate at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the maximum pole intensities at these positions.



**Figure S7.** {0001} pole figures of the annealed plate (250°C) at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the maximum pole intensities at these positions.



**Figure S8.** {0001} pole figures of the annealed plate (275°C) at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the maximum pole intensities at these positions.



**Figure S9.** {0001} pole figures of the annealed plate (300°C) at different positions across the thickness: (a) upper, (b) upper quarter, (c) center, (d) lower quarter, and (e) lower position; and (f) shows the maximum pole intensities at these positions.