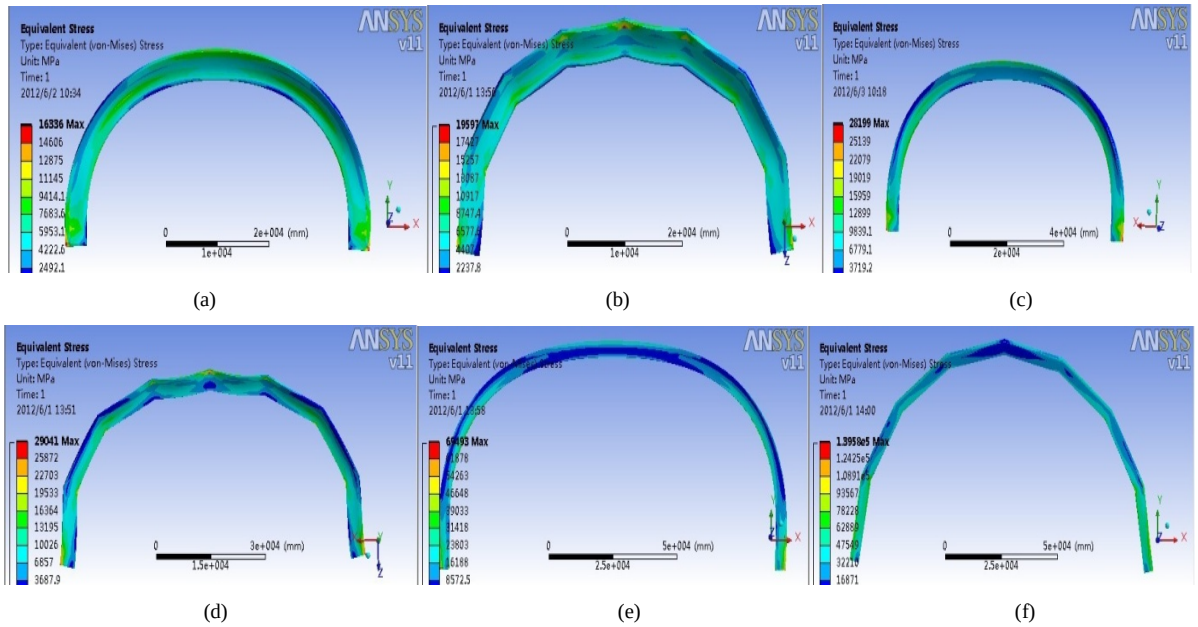

Figure 5. The radius effect on the stress and the strain distribution: (a) The 1m radius effective stress distribution of rolling-bending process, (b) The 1m radius effective strain distribution of die forming process, (c) The 1.5m radius effective stress distribution of rolling-bending process, (d) The 1.5m radius effective stress distribution of die forming process , (e) The 2.5m radius effective stress distribution of rolling-bending process, (f) The 2.5m radius effective stress distribution of die forming process

Compared to various radiuses of u beams steel arches, the arch equivalent radius of 2.5 meters, the strain is more than a radius of 1 m, 1.5 m and 2 m arch. That is, the larger the radius, structural more reliability, and prone to more stress concentration risk of larger stress and strain.

IV. CONCLUSIONS

(1) Compare to die forming arch, the rolling-bending arch has smaller equivalent elastic strain small, stress, stress concentrated. The maximum deformation of rolling-bending arch is the top of arch and die forming arch is at fold corner (feet on both sides of u steel arch). The equivalent stress of roll bending steel is twice of die forming arch.

(2) The equivalent stress of die forming and rolling-bending arch all become larger as the radius increase. So the arches with small radius have more security than that of large radius.

(3) rolling-bending arch has better security than the die forming arch as the uniformity mechanical properties, and the structure better reliability.

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