

Investigation of the processes of deformation of super flywheels made by packing its layers on each other

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Abstract

© Published under licence by IOP Publishing Ltd. In the work for different cases of nozzles of layers of the super-magnetic pendulum, exact solutions in the stresses are obtained, and estimates of the increase in its specific energy are given. Dependences of tensile stresses in a tape are obtained when winding it into a super-flywheel, an increase in the specific kinetic energy in the super flywheel is observed with a decrease in the relative radius of the inner hole.

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References

- [1] Drum T O 2011 Energy storage-flywheel <http://www.resilience.org/stories/2011-10-05/energy-storage-flywheel-ref-separator> -
- [2] Gulia N V 1976 *Machovichnye dvigately* (Moscow: Mashinostroenie) 163
- [3] Gulia N V 1980 *Nakopitely Energii* (Moscow: Nauka) 152
- [4] Matveev V V, Pisarenko G V and Yakovlev A P 1988 *Spravochnik po soprotivleniyu materialov* (Kiev: Naukova Dumka) 736
- [5] Seong-yeol Y, Wook-ryun L, Yong-chaе B and Myounggyu N 2010 *Journal of Mechanical Science and Technology* 24 231-235
- [6] Berezhnoi D V, Chickrin D E and Galimov A F 2014 *Applied Mathematical Sciences* 8 6181-6190
- [7] Berezhnoi D V, Chickrin D E, Kurchatov E Yu and Galimov A F 2014 *Applied Mathematical Sciences* 8 8125-8135
- [8] Berezhnoi D V, Chickrin D E, Gajnulina L R, Kurchatov E Yu, Kokunin P A, Sozutov I G and Shigapov M I 2015 *Contemporary Engineering Sciences* 8 1703-1712
- [9] Berezhnoy D V, Gajnulina L R and Sekaeva L R 2015 *International Journal of Applied Engineering Research* 10 44672-44676
- [10] Abdrakhmanova A I and Sultanov L U 2016 *Materials Physics and Mechanics* 26 30-32
- [11] Golovanov A I and Sultanov L U 2005 *International Applied Mechanics* 41 614-620
- [12] Davydov R L and Sultanov L U 2015 *Journal of Engineering Physics and Thermophysics* 88 1280-1288
- [13] Sultanov L U and Fakhrutdinov L R 2013 *Magazine of Civil Engineering* 44 69-74
- [14] Sultanov L U and Davydov R L 2013 *Magazine of Civil Engineering* 44 64-68
- [15] Sachenkov O, Kharislamova L, Shamsutdinova N, Kirillova E and Konoplev Yu 2015 *IOP Conference Series: Materials Science and Engineering* 98 012015
- [16] Sachenkov O, Hasanov R, Andreev P and Konoplev Y 2016 *IOP Conference Series: Materials Science and Engineering* 158 012079
- [17] Shigapova F A, Mustakimova R F, Saleeva G T and Sachenkov O A *International Journal of Applied Engineering Research* 10 44711-44714
- [18] Sachenkov O A, Mitryaikin V I, Zaitseva T A and Konoplev Yu G 2014 *Applied Mathematical Sciences* 8 7889-7897
- [19] Badriev I B, Banderov V V, Makarov M V and Paimushin V N 2015 *Applied Mathematical Sciences* 9 3887-3895

- [20] Badriev I B, Banderov V V and Zadvornov O A 2013 Applied Mechanics and Materials 392 188-190
- [21] Badriev I B, Garipova G Z, Makarov M V and Paimushin V N 2015 Research Journal of Applied Sciences 10 428-435
- [22] Rabotnov Y N 1962 Soprotivlenye materialov (Moscow: Fizmatgiz) 456
- [23] Berezhnoi D V and Gajnulina L R 2016 IOP Conference Series: Materials Science and Engineering 158 012017
- [24] Berezhnoi D V, Chickrin D E, Gajnulina L R, Kurchatov E Yu, Kokunin P A, Sozutov I G and Shigapov M I 2016 Contemporary Engineering Sciences 9 1591-1598