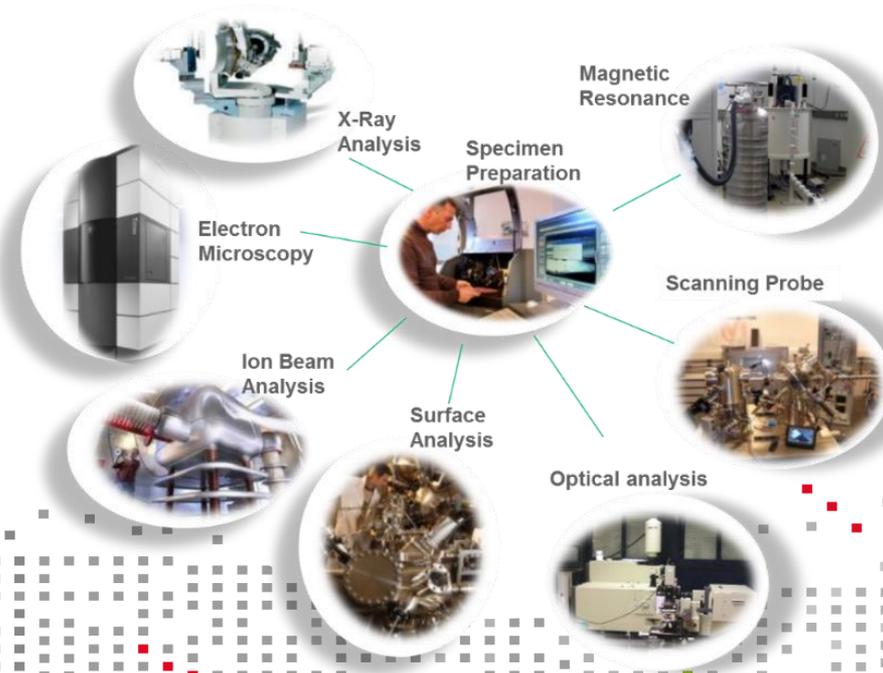


Platform For Nano Characterization (PFNC)



ATOMICJ



AtomicJ: An open source software for analysis of force curves

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<https://doi.org/10.1063/1.4881683>

Download site <https://sourceforge.net/projects/jrobust/>

Project Activity

Released [/2.0/AtomicJ_2.0_OS_Independent.zip](#)

Released [/2.0/AtomicJ_2.0_Win64.zip](#)

Released [/1.8.2/AtomicJ_1.8.2_OS_Independent.zip](#)

Released [/1.8.2/ReleaseNotes_AtomicJ_1_8_2_readme.txt](#)

Released [/1.8.2/AtomicJ_1.8.2_Win64.zip](#)



3 months ago

3 months ago

1 year ago

1 year ago

1 year ago

[See All Activity >](#)

AJ is written in JAVA SE 7 (JFreeChart, JAMA, Commons Math, FreeHELP, Sansel-an, Commons Compress, Bio-Formats and iText® 2.1.5)

⇒ Windows (7 & 10) 64 bits with JAVA run time environment

⇒ OS independent (MAC OS, Linux, older Windows)

⇒ Memory allocation

⇒ Default needed RAM is 3Gbits

⇒ Reallocate more memory using the shell command (win) :

java -XmxmemoryMaximumm -jar AtomicJ.jar

(*memoryMawimum* in Mbits / see AJ manual, page 6)

AtomicJ supports :

- plain text files
- Agilent
- JPK Instruments
- Asylum Research
- Park Systems
- NT-MDT
- Nanosurf
- AFMWorkshop.
- It also supports some file formats generated by the Nanotec Electronica WSxM software.
- Bruker
 - Nanoscope 9.2/9.3 & older : full compatibilities (FV & PFC)
 - Nanoscope 9.4 : issues on supporting PeakForce Capture
 - Nanoscope 9.7 (Win10) : issues on Ramp & Hold & PeakForce Capture

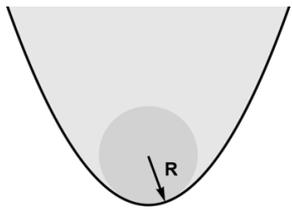
ATOMICJ – THE DOWNLOADED FOLDER (AFTER UNZIPPING)

The software



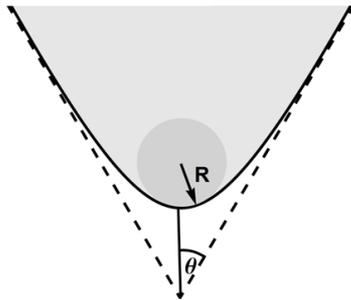
 AtomicJ_lib	10/11/2019 15:43	Dossier de fichiers	
 jre1.8.0_181	10/11/2019 15:44	Dossier de fichiers	
 Resources	10/11/2019 15:44	Dossier de fichiers	
 AtomicJ	05/10/2018 09:00	Application	61 Ko
 AtomicJ	05/10/2018 09:00	Executable Jar File	5 857 Ko
 AtomicJ_2.0.1	05/10/2018 09:00	Document XML	3 Ko
 AtomicJ_Users_Manual	05/10/2018 09:00	Adobe Acrobat D...	4 391 Ko
 launch4j	05/10/2018 09:01	Document texte	4 Ko
 license_GPL	05/10/2018 09:01	Document texte	18 Ko
 README	05/10/2018 09:01	Document texte	7 Ko

ATOMICJ – SUPPORTED TIP SHAPES



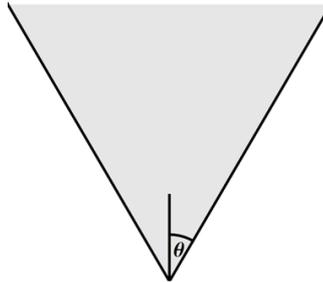
Paraboloid

that approximates sphere in the Hertz's equation. R – radius of curvature at the apex



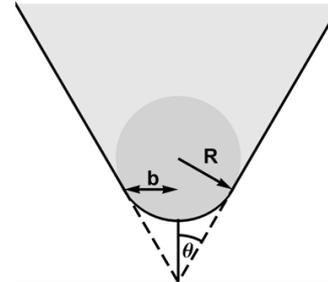
Hyperboloid

R – radius of curvature at the apex, θ – half angle between the asymptotes.



Cone

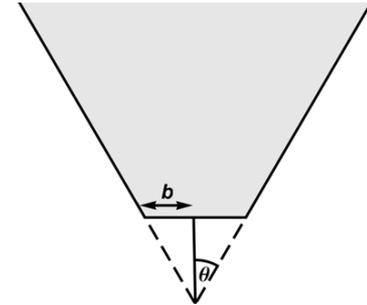
θ – half angle.



Blunt cone

(cone capped by a sphere).

R - radius of curvature at the apex, b – tip radius at the level of transition between the capping sphere and the cone, θ – half angle. If the transition from sphere to cone is smooth, then $b = R\cos[\theta]$.



Truncated cone

b – truncation radius, θ – half angle

ELASTIC MODELS

1. Sphere (Hertz) - 2. Sphere (Sneddon) (Sneddon 1965) - 3. Sphere, thin sample (Dimitriadis et al. 2002) - 4. Hyperboloid (Akhremitchev and Walker 1999) - 5. Cone (Harding and Sneddon 1945) - 6. Cone, thin sample (Gavara and Chadwick 2012) - 7. Power-shaped (Galini 1946). - 8. Blunt cone (Briscoe et al. 1994). - 9. Truncated cone (Briscoe et al. 1994). – 10. Pyramid, regular, four sided (Bilodeau 1992) - 11. Blunt pyramid, regular, four-sided (Rico et al. 2005) – 12. Truncated pyramid (Rico et al. 2005).

HYPERELASTIC MODELS

13. Sphere, Fung's hyperelastic model (Fung 1979) - 14. Sphere, Ogden's hyperelastic model (Ogden 1972)

ADHESIVE CONTACT

15. Derjaguin-Muller-Toporov (DMT) (Derjaguin et al. 1975) - 16. Johnson-Kendall-Roberts (JKR) (Johnson et al. 1971) – 17. Sphere, Maugis solution. Maugis (1995) - 18. Hyperboloid, Sun-Akhremitchev-Walker (SAW), Sun et al (2004)

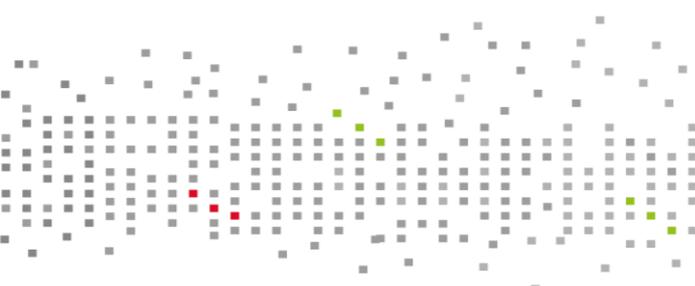
See a full descriptions of the models at :

ftp://ftp.aip.org/epaps/rev_sci_instrum/E-RSINAK-85-038406/Supported%20contact%20mechanics%20models.docx

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- The ease of use (very intuitive, useful manual)
- The large scope of embedded contact mechanics models / tip shapes
- The advanced mathematical computation for contact point determination
- The curves pre-processing (cropping, filtering)
- Automatic/manual contact point determination curve by curve (by a least square fit regression) without any “range” applied for ALL the curves
- The patching : applying different mechanical modeling on different patches of the surface.
- Seeing the fit on each curve (+ the R^2 map)
- The pointwise modulus
- The batch processing
- The statistics (& the histograms) including on ROIs
- The stacks images
- The aim to open & treat .csv / .tsv raw data

- No models on viscoelasticity
- No patch saving (or via ROI ?)
- Minor bugs on “live charts style”
- No full compatibility with recent Bruker/Nanoscope file formats
- Future version / support ?



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